Current Trends in IT

Cloud Computing

Cloud computing is a general term for anything that involves delivering hosted services over the internet. A cloud service has three distinct characteristics that differentiate it from traditional hosting. It is sold on demand (typically based on usage), it is elastic (a user can have as much or little service at any given time) and the service is fully managed by the provider (the consumer needs nothing other than a computer and an internet connection). Significant innovations in virtualization and distributed computing, as well as improved access to hi-speed internet and a weak economy, have accelerated interest in cloud computing.

A cloud can be private or public. A public cloud sells services to anyone on the internet. A private cloud is a proprietary or a data center that supplies hosted services to a limited number of people. When a service provider uses public cloud resources to create their private cloud, the result is called a virtual private cloud. Cloud computing providers offer their services according to several fundamental models.

1. Infrastructure as a Service (IaaS) – virtual machines, storage devices, servers, load balancers and network devices.
2. Platform as a Service (PaaS) - operating system, programming language execution environment, database, and web server.
3. Software as a Service (Saas) – CRM, Email, Virtual Desktop, Communication Games etc.

Accounting information systems can be hosted over cloud computing. A service provider installs and maintains all the resources required to run the accounting system on behalf of its client. Client can use the accounting system over the web and pay a fee for use to the service provider. Majority of cloud service providers charge for the volume of usage (based on number of users). Usually there is a Service Level Agreement (SLA) that needs to be signed between the client and the service provider. Typical cloud computing service provider examples would be google and amazon.

Advantages of cloud computing

1. Cheaper
2. No need to maintain the infrastructure
3. Need lesser staff
4. More physically safer

Disadvantages of cloud computing

1. Privacy concerns because the service provider can access the data that is on the cloud at any time.
2. Data could accidentally or deliberately alter or even delete information.
3. Many cloud providers can share information with third parties if necessary for purposes of law and order even without a warrant.
4. There is the problem of legal ownership of the data
Bring Your Own Device

Bring your own device (BYOD)—also called bring your own technology (BYOT), bring your own phone (BYOP), and bring your own PC (BYOPC)—refers to the policy of permitting employees to bring personally owned mobile devices (laptops, tablets, and smart phones) to their workplace, and to use those devices to access privileged company information and applications. Almost 40-50% of the employees in developed countries use BYOD.

Advantages of BYOD

1. Increased productivity. Familiarity in using the device
2. Employee satisfaction
3. Cost Saving

Issues in BYOD

1. Device is used to access both sensitive and risky networks.
2. BYOD has resulted in data breaches. Smartphones could be used by outsiders to get sensitive data or after employees leave the organization data may still reside in their devices.
3. Scalability and capability to handle large amount of data and resource requirement when using BYOD.

As a solution, BYOD policies should be generated, employees should be trained periodically on the same. The employees should read and sign that they have understood and abide by the policy.

Big Data

With the recent explosion in the volume of data generated for business purposes (e.g.: purchase transactions, network device logs, security appliance alerts), current tools may not be sufficient to analyse them. By necessity now big data uses data sets that are so large that it becomes difficult to process those using readily available database management tools or traditional data processing applications. The paradigm shift introduced by big data requires a transformation in the way that such information is handled and analysed, moving away from deriving intelligence from structured data to discerning insights from large volumes of unstructured data. Big data not only encompasses the classic world of transactions, instead brings in wide range of mutistructured data sources.

It is assumed there will be 4300% data increase by the year 2020. However, all data is not necessary. This is where advanced tools such as business intelligence software will become handy to filter out information and provide meaningful up to date and relevant information for decision making and better operation to an organization. The three V’s of big data are volume, velocity and variety.

Advantages of Big Data

1. BigData gives organisations the opportunity to discover data correlations and patterns that before would have remained hidden. This means organisations now have access to more accurate information which can influence their business.
2. Marketing strategies to be improved and more accurately targeted. This could help to greatly increase organisation’s customer base, and push the organisation ahead of the competition.
3. Increase in revenue as the organisation is able to both cut costs and attract more customers.

Disadvantages of Big Data

1. Increase in overheads to store and analyse very large amount of data.
2. If the data is not analysed sufficiently, or unwanted data is analysed, it becomes garbage and no value addition to the organization.
3. Big data could end up in breach of confidential information if its reaches unwanted stakeholders.

IT Governance - IT Governance is defined as the processes that ensure the effective and efficient use of IT in enabling an organization to achieve its goals. Today’s IT business environment requires regulatory compliance, cost control, availability, risk management business alignment, timely project delivery, change and continuous innovation to deliver stakeholder value. Fulfilling these demands is the responsibility of the board of directors and executives to ensure effective oversight of IT, making IT governance integral to overall corporate governance. The three key aspects of IT governance are,

1. What are the essential decisions that must be made for effective management and IT usage?
2. By whom they should be made?
3. How will they be monitored to ensure control?

Well-designed, well understood and transparent governance mechanisms are critical. Different well known standards and frameworks such as COBIT, ITIL, ISO27001 could be used for establishing IT Governance.

The following steps should be systematically followed when implementing IT Governance for an organization.

Step 1 – Initiate program – A strategic plan for the business should be established. This requires obtaining ownership at the board and executive level. Initial awareness should be created involving business and IT management, and establishing an IT governance project organization.

Step 2 – Define problems and opportunities – Assess existing IT governance processes and identify problems and opportunities (AS-IS situation assessment).

Step 3 – Define road map – Where do we want to be? Based on the results of the as-is assessment, the focus moves to defining what an ideal governance model will look like. An implementation road map shall be established.

Step 4 – Plan program – What needs to be done? The IT project work commences in this phase by establishing effective governance. This includes identifying people and groups to be involved, such as the IT Steering Committee, the project steering committee and the Chief Information Officer. In addition to this, an IT project governance methodology, IT portfolio management, budget control and reporting standards are established.
Step 5 – Execute Plan – How to we get there? Obtaining the participation of the business, focus on relational and change management mechanisms and effective communication. In this phase, policies and procedures are also established to increase transparency.

Step 6 – Realize Benefits – Did we get there? The effectiveness of the IT governance implementation is determined by considering number of factors including a comprehensive model for managing all IT resources, improved executive participation, strategies and business objectives for IT investment alignment between business and IT objectives, decision making and communication perception of IT value, IT risk management, Return on investment, IT performance and IT innovation.

Step 7 – Review effectiveness – How do we keep the momentum going? In this final phase, monitoring and reviewing IT governance, planning and sustaining IT governance. This also focuses on establishing a balance score card and continuous monitoring of IT governance framework.

IT Service Management

To support IS operations, many organizations have implemented IT Service Management (ITSM), a concept that comprises processes and procedures for efficient and effective delivery of IT Services to business. Although each of these process areas may have separate and distinct characteristics, each process is also interdependent with other processes. These processes once defined can be better managed through service level agreement (SLA) that serve to maintain and improve customer satisfaction. IT Service Management best practices are taken from ITIL framework and the corresponding standard for an organization to get certified would be ISO20000.

A SLA is an agreement between the IT organization and customer. The SLA details the service(s) to be provided. The IT organization could be an internal IT department or an external service provider. The SLA describes the services in nontechnical terms, from the view point of the customer. During the term of the agreement, it serves as the standard for measuring and adjusting the services.

The processes to be covered under the IT Service Management are as follows.

Service Transition – Are new services and changes to services managed to ensure that these are delivered at the right cost and service quality

Change Management – Are all changes assessed, approved, implemented and reviewed in a controlled manner

Incident and Service Request – Are all incidents recorded and resolved

Capacity Management – Does the organization has sufficient capacity to meet the current and future agreed demands of the business at all times

Business Relationship Management – Is a good relationship between the service provider and customer established and maintained based on understanding the customer and their business drivers

Budgeting & Accounting for Services – cost of service provision budgeted and accounted
Supplier Management – Are 3rd party suppliers managed to ensure the provision of seamless quality services

Service Level Management – Defining, agreeing, recording and managing IT service levels

Problem Management – Is there a proactive identification and analysis of the cause of service incidents and managing problems to closure to minimize disruptions to the business

Information Security Management – Information security effectively managed for all service activities

Availability Management – all agreed obligations to customers need to be met in all circumstances

Configuration Management – Are components of the service and infrastructure defined and controlled and accurate configuration information maintained

Release & Deployment – Is the release of the services, systems, s/w and hardware planned and deployed by the service provider with the business

Service Continuity – Service continuity plans should be established and tested.

Outsourcing IS/IT Function

Financial and costs benefits are often put forward as the reasons why organisations decide to outsource. Emerging patterns and trends indicate that today’s outsourcing decisions are often motivated by factors other than cost. The type of IT/IS functions that companies are choosing to outsource continues to both change and develop. Currently in the UK, IT/IS operations dominate the outsourcing market, with hardware maintenance as the most outsourced service (about 70%), followed by mainframe or data centre management (38%), and PC support, network management (25%). UK outsources IS/IT functions to developing countries.

Advantages of outsourcing IS/IT Functions
1. major cost saving
2. focus on core activities
3. no need to focus on technological advancement and its impact
4. specialized service can be obtained

Disadvantages of outsourcing IS/IT Functions
1. need to rely on the service provider
2. maintaining confidentiality may be an issue
3. unable to regain the service
4. service level agreements should be met by the service provider
Legal and Regulatory compliance issues surrounding information systems

In the last few years, governments the world over have taken up the job of protecting consumers and companies against poor management of sensitive information. Depending on the industry, each organization may be used to regulations. Banks and financial institutions are regulated by Central bank of Sri Lanka whilst the Telecommunications are regulated by Telecom Regulatory Board. The late 1990s and early 2000s ushered in the era of laws governing information security, privacy, and accountability, thanks in part to companies like Enron and in part due to the sheer volume of personal and sensitive information stored in and transmitted through vulnerable channels. These legal and regulation rules should be included to a commercial software used by the organizations, failing which it is a violation of the regulatory and legal affairs, which may cause imprisonment the board of directors.

Examples of laws and regulations affecting information systems

1. **Sarbanes-Oxley** - The Sarbanes-Oxley Act of 2002 (SOX) was a response to corporate scandals. Its most prominent aspect, from an IT perspective, is Section 404, which requires that the annual reports of public companies include an end-of-fiscal-year assessment of the effectiveness of internal control over financial reporting. Section 404 also requires that the company’s independent auditors attest to, and report on, this assessment. The assessment of financial controls has been extended into the IT space by the opinion of the Public Company Accounting Oversight Board (PCAOB), a private-sector, non-profit entity created by SOX to oversee the auditors of public companies. This extension of financial controls into the IT space provides most of the current impetus for IT controls.

2. **Payment Card Industry Data Security Standard (PCIDSS)** - The Cardholder Information Security Program (CISP) was instituted by Visa USA and MasterCard International. Mandated since June 2001, the program is intended to protect cardholder data—wherever it resides—ensuring that members, merchants, and service providers maintain the highest information security standard. Using the Payment Card Industry (PCI) Data Security Standard as its framework, CISP provides the tools and measurements needed to protect against cardholder data exposure and compromise across the entire payment industry. The PCI Data Security Standard consists of 12 basic requirements supported by more detailed subconditions.

Several IT best practice standards and models exist which can be adopted to benchmark and adhere to the processes of the organizations. Find below the examples of such IT best practice standards and models.

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<th>Practice</th>
<th>Orientation</th>
<th>Developed By</th>
<th>Description</th>
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<tr>
<td>Turnbull Report</td>
<td>Process Guidance</td>
<td>Institute of Chartered Accountants of England and Wales</td>
<td>The combined code on corporate governance for the UK. (<a href="http://www.icaew.co.uk/internalcontrol">www.icaew.co.uk/internalcontrol</a>)</td>
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<tr>
<td>CobiT</td>
<td>Process Control and Management</td>
<td>Information Systems Audit and Control Association/ IT Governance Institute (ISACA/ITGI)</td>
<td>A process standard for Public Company Accounting Oversight Board (PCAOB). (<a href="http://www.isaca.org">www.isaca.org</a>)</td>
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Software contracts too needs to be considered when discussing about legal and regulatory compliance issues. Both the software vendor and the customer should abide by the contract terms, failing which legal action or penalty clauses could be imposed. Service level agreement violations, payment term violations, disclosure of sensitive information and unsettlement of liabilities within the due period can be subject to legal actions.

**Accounting and costing issues in delivering information systems**

1. **Quality of data**
   The increasing dependence of Organization on Accounting Information System to fulfill their mission in this information age demands a proactive and strategic approach to data quality management. Data are collected, stored, elaborated, retrieved and exchanged in information system used in organization to provide services to business operations. Data stored in organizational database have a significant rate of error, between one and twenty percent of data items in organizational database are estimated to be poor. Inaccurate data which include invalid and inaccurate data can originate from different data sources – through data entry, data migration and conversion projects. Data quality issues are one of the critical problems facing organizations in today’s business environment.

   Despite this, errors in database are often neglected issues within organizational Accounting Information System and decision support system. “Too often data are used uncritically without considerations of error contain within and this lead to erroneous result, misleading information, wrong decision and increased cost”. Accounting information is a powerful tool that aid decision making by providing financial information to a variety of users. The foundation of Accounting Information System is providing information that is readily available and accessible for decision support and improved services and operation. Information that can be utilized in this way must be accurate, reliable and consistent in order to make intelligent and effective business decision based on facts. If this is not so, the Accounting Information System becomes useless and mere waste of resources.

2. **Accounting Standards**
   Each country has its own accounting standards, although with the globalisation, International Accounting Standards (IAS) has been defined for the benefit of international organisations. Due to this issue, an accounting system may not suite certain organisation due to the difference in accounting treatment and reporting. Hence, the information systems needs to be customised to
suite the organisations which may end up in errors. For example all PLC, banking and financial institutions in Sri Lanka are required to adopt to IFRS which is not supported by most of the ERPs. Either a separate system should be implemented and interfaced with the core system or the existing core system needs to be customised to suite the IFRS requirements.

3. Management Accounting

Unlike financial reporting, management accounting is done within the organisation for the purpose of improving efficiency and effectiveness. Management accounting is not a statutory requirement. The accounting system used should facilitate basic and advanced management accounting reports, required by the organisation (e.g.: cost variance reports). Further these reports should be obtained with minimal effort from the management accountant. These reports should be accurate, timely and relevant.

4. Controls in place

The system should have sufficient segregation of duties controls such as maker checker and SOD matrix clearly defined. Without proper controls in place, there is no benefit for an organisation to have an information system. Further access to database should be removed and admin/super user account access should be restricted only to few individuals. Controls in an information systems should be placed at the input, processing and output level.