CS565 - Business Process & Workflow Management Systems

BPM & Cloud Computing
Cloud Computing

- **Cloud computing** is the use of various services, such as software development platforms, servers, storage and software, over the internet, often referred to as the "cloud." (techopedia)

- In general, there are three cloud computing characteristics that are common among all cloud-computing vendors:
  - The back-end of the application (especially hardware) is completely managed by a cloud vendor.
  - A user only pays for services used (memory, processing time and bandwidth, etc.).
  - Services are scalable
Cloud Computing - The Next Revolution in IT

- Classical Computing
  - Buy & Own
    - Hardware, System Software, Applications often to meet peak needs.
  - Install, Configure, Test, Verify, Evaluate
  - Manage
  - ..
  - Finally, use it

- Cloud Computing
  - Subscribe
  - Use
  - Pay for what you use, based on QoS

Do you Use the Cloud?
5 Reasons Businesses Use the Cloud

Every year, more and more businesses are adopting cloud. While traditionally thought of as an IT decision, cloud is increasingly being considered a business decision to enable company functions. Take a look at five reasons why more businesses are adding the cloud to their technology arsenals.

1. It offers better insight and visibility
   Businesses are using cloud technology to support their analytics efforts. Of leading organizations:
   - 54% use analytics extensively to derive insights from big data
   - 59% use cloud to share data seamlessly across applications
   - 59% intend to use cloud to access and manage big data in the future

2. It makes collaboration easy
   Cloud allows work to be accessed from anywhere on multiple devices, making cross-functional collaboration much easier. Here’s what leading organizations—those that are gaining competitive advantage through cloud—cited as popular uses:
   - 58% collaborate across the organization and ecosystem
   - 59% improve integration between development and operations

3. It can support a variety of business needs
   Companies are forging a tighter link between technology and business outcomes. Take a look at the business functions companies have migrated to the cloud.
   - 18% messaging
   - 15% storage
   - 13% office/productivity suites

4. It allows for rapid development of new products and services
   The cloud offers businesses valuable capabilities. Here’s what leading organizations say it enables them to do:
   - 52% use it to innovate products & services rapidly
   - 24% are able to offer additional products & services

5. The results are proven
   From business growth to increased efficiency, businesses using cloud are realizing benefits across the company.
   - 25% of businesses saw a reduction in IT costs
   - 55% saw an increase in efficiency
   - 49% saw improvement in employee mobility

Sources: CDW, IBM Center for Applied Insights
Cloud Service Models

- **Cloud Service models:**
  - **Software as a Service (SaaS)** is a model in which software is offered as a service to the user. The software is hosted on a server and users access the software by using a web browser.
  - **Platform as a Service (PaaS)** is the offering of a computing platform as a service. Users are able to deploy their applications on such a platform. The platform offers auxiliary functionality such as a web server, databases, load balancing and more.
  - **Infrastructure as a Service (IaaS)** the cloud offers platform virtualization to the customer. The user is offered a virtual machine with some storage. Instead of buying servers and other network equipment, users just rent these resources.
Cloud Service Models

- **SaaS**
  - Packaged Software
  - OS & Application Stack
  - Servers Storage Network

- **PaaS**
  - OS & Application Stack
  - Server Storage Network

- **IaaS**
  - Server Storage Network

- **End Users**
- **Application Developers**
- **Infrastructure & Network Architects**

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Cloud Service Models

Source: https://www.visma.com/blog/cloud-basics-the-layers/
Users and providers of Cloud Computing
Users and providers of Cloud Computing

Source: http://www.xorlogics.com/
"Business Process as a Service" (BPaaS) is considered as a new paradigm that introduces the next abstraction from IaaS, PaaS, SaaS towards domain specific BPaaS. Hence, BPaaS is not seen as a technical combination of SaaS, but is seen as a mediator between IT-agnostic business users and Cloud computing.

This projects puts forth the idea of a “hybrid process” modelling framework applying well-known techniques for semantic, rule-based inference, meta modelling and knowledge management techniques to bridge the gap between business needs and the use and exploitation of Cloud resources and components.

https://site.cloudsocket.eu/

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Lifecycle of a Multi-Cloud Application

1. **Infrastructure Description** (Performance analysis)
2. **Requirements Specification** (Resource dependencies, Formality, Semantics)
3. **Matchmaking**
4. **Deployment**
5. **Cloud Abstraction Layer**
6. **Monitoring** (Cross-layer)
7. **Adaptation** (Cross-layer)
8. **Model Enhancements**
9. **Re-deployment**
10. **Re-design**
Top obstacles to cloud computing

1. Availability of service
2. Data lock-in
3. Data confidentiality
4. Data transfer bottlenecks
5. Performance unpredictability
6. Scalable storage
7. Bugs in large-scale distributed systems
8. Scaling quickly
9. Reputation fate sharing
10. Software licensing
Recommended Reading

- https://www.youtube.com/watch?v=ae_DKNwK_ms
- https://www.youtube.com/watch?v=3WIJ4axzFlU
- https://www.youtube.com/watch?v=whkyRvugqlM