Cloud Computing (CS60118)

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Introduction

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Introduction

- Though the farmers are growing same crops for centuries, the ever changing weather conditions, soil fertility, pests and diseases etc. still affects the final outcome.

- Information Technologies and tools.

- Information Communication Technology(ICT)

- That latest and most promising area of ICT is Cloud Computing.

Cloud Computing

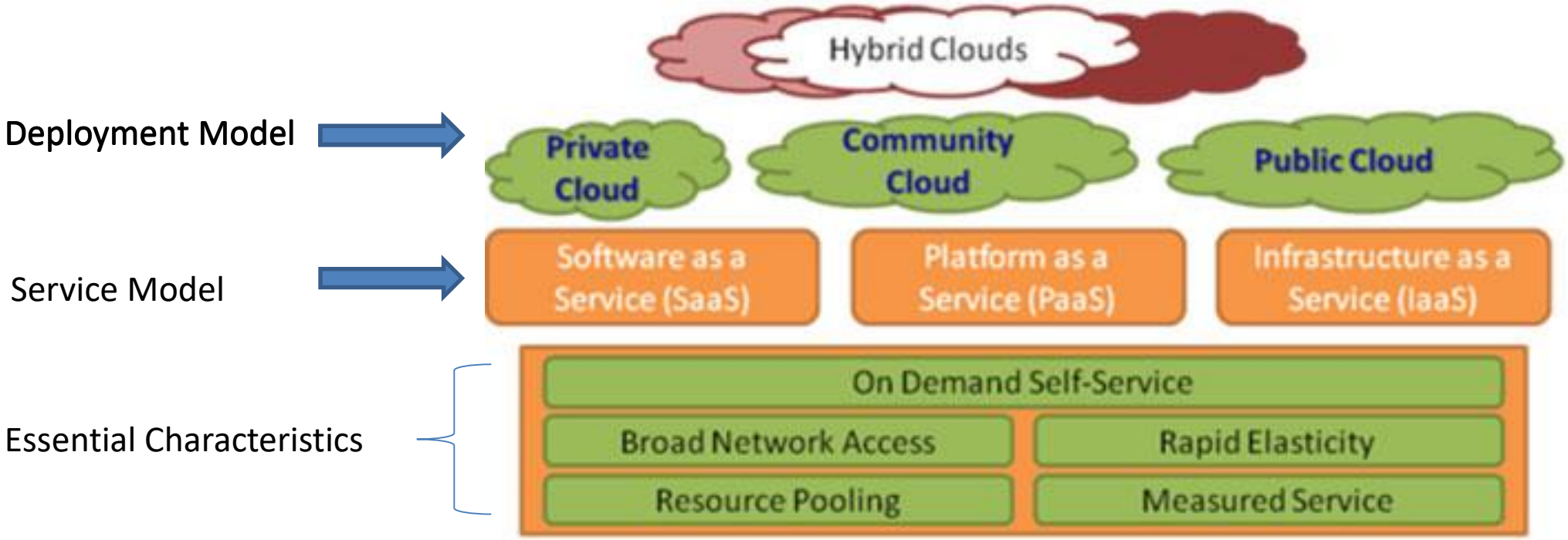
- The term “cloud computing” refers to the fact that users do not really need to know who is providing those services and the cloud hid all the technicalities from them.

- less manpower and zero maintenance.

- Cloud computing, it has three different deployment models namely private, public and hybrid.

- Cloud computing offers the following basic models to deliver the services.
  - Software as a Service (SaaS)
  - Platform as a Service (PaaS)
  - Infrastructure as a Service(IaaS)

Cloud Computing Framework



Source: Tseronis, Lewin, Garbas and Mell (2010, p.15)

Current Challenges in Indian Agriculture

- Poor knowledge about the weather forecast, pests and diseases.
- Deficient production information.
- Not enough sales and distribution information.
- Poor ICT infrastructure and ICT illiteracy.
- Lack of awareness among farmers about the benefits of ICT in agriculture.
- Insufficient power availability in rural areas.

Applications

➢ Cloud computing can help with real-time computation, data access, and storage to users without having to know or worry about the physical location and configuration of the system that delivers the services.

➢ Some of the specific uses are as follows:-

- Crop-related information:
  - ❖ It can capture information related to all crops grown in the recent past, and thus can help farmers make decisions on what to grow next.
  - ❖ **Weather information**: The cloud can store region-specific weather information and as well as the weather forecast for specific durations.

Applications

- **Soil Information:** Apart from soil profile, it can also provide a trend of soil in the past, which will help in predicting the trend in future. For example, is the soil turning acidic/alkaline, or, what other changes in nature and composition of soil can be seen.

- **Monitoring Growth:** This enables growth patterns to be compared with past growth patterns.

- **Farmers' Data:** Region-wise farmer data can be captured, monitor and study the involvement of local farmers. This can help in the identification of core agricultural areas, which are helpful for policymakers while framing their strategies.

Applications

- **Expert Consultation**

- **E-commerce** People from rural areas are unable to sell their own produce directly to the market. Many middlemen pop up in between the retail and production ends, which ultimately leads exploitation of the farmers. Through the agricultural management information system of cloud computing, farmers can sell their produce directly to the end users/retailers.
- **Practical Information Sharing:** Scientists working at agriculture research stations can share their own discoveries and suggestions regarding modern techniques for cultivation, usage of fertilizers in the cloud.

Advantage

- Less or no expenditure.
- On-Demand
- Measured service
- **Data management.** The data will be managed by the service provider, a team of professionals. That guarantees a better and organized management of data.
- **Data readiness.** This provides data from the e-data bank databases to its entire stakeholder at any time and at any location.

Advantage

- **Local and global Communication.** This makes the communication between different users much faster, easier and cheaper. Also the communication will be secured.

- **Rural-urban migration.** A major problem of Andhra Pradesh is rural-urban migration. It can be reduced as this provides its services all over the state and may also all over country at any time no matter how remote the place is. This will also help in controlling unemployment problem in the state and country.

Advantage

- **Security.** It provides an enhanced security as the resources will be stored in cloud and will be maintained centrally by the service providers. Thus, it is not a cause of concern for its users.

- **Motivation.** It will motivate the farmers and researchers to get involved more and more into agriculture as any communication will be result oriented. That will result in overall development of this sector in the nation.

- **Reduction of technical issues.** It cuts short the man power, maintenance and infrastructure requirement drastically, as it will be provided by the service providers.

Advantage

- **Overall economy.** Implementation of cloud computing in agriculture sector will help in uplifting the agricultural sector of the country. That will boost the overall development of the economy. It is due to the mass involvement of different stakeholders, as the system will monitor and deliver progress report whenever and wherever needed.

Challenges

- Conflict in different country laws. It demands a careful selection of the provider and may also require negotiation in drawing an effective agreement between the service providers and State.

- Another concern is the security and privacy. The nation may not be willing to hand over sensitive data to a third party.

- Cloud computing demands high bandwidth internet connectivity. For example, the current international bandwidth of Andhra Pradesh is 325Mbps, which is just sufficient to cater the basic needs in the state only, for entire India more than 1200Mbps is needed.

Challenges

- Lack of resources/expertise/ knowledge
- Availability of IT resources at different locations in vast country like India
- Availability of uninterrupted power supply
- Security of data and services.

Solutions by Cloud Computing

- Sending advisory audio and text messages based on weather forecasts, crop calendars, pest and disease prevention/control and market alerts.

- Provides early warnings on upcoming weather conditions such as cyclones, drought and rain.

- Provides market price information so that farmers can get the best possible price.

- Provides information on new seeds, inputs and technology.

Solutions by Cloud Computing

- Farm Produce Traceability.
- Farm Data Management system can enables large agriculture businesses to have complete control over their farming processes and visibility across different stakeholders
- **Farmer Advisory Services.**
  - Sending advisory audio and text messages based on weather forecasts, crop calendars, pest and disease prevention/control and market alerts.
  - Provides early warnings on upcoming weather conditions such as cyclones, drought and rain.
  - Provides market price information so that farmers can get the best possible price.
  - Provides information on new seeds, inputs and technology.
- **Monitoring & Evaluation**

Solutions by Cloud Computing

- **Supply Chain Management.**
  - Forecast the volume and plan the harvest schedule based on the yield estimation, crop area and crop calendar.
  - Digitization of various farmer organizations and farmer groups.
  - Tracks the current location of the produce through GPS tracking.

- **Market Linkage**
  - Enable farmers to participate in global markets by providing visibility to the buyer.
  - Informing the farmer of available markets and prevailing prices.
  - Connects farmers and buyers through a common portal.

Solutions by Cloud Computing

- **Financial Services.**
  - Comprehensive management of all financial services in agriculture value chain including credit, crop insurance, collections and payments.
  - Digitization all financial transactions with the farmers to provide transparency and accuracy of their operations for accessing credit.
  - Minimize the risk of financial institutions to provide crop loans to the farmers by aiding in establishing farmers' credit worthiness and real-time monitoring of the crop growth and yields.
  - Integration with digital and mobile wallets.

Case study 3:

Krishi Pragati Foundation (KPF)

use **SourceTrace** to give digital solution

Case study: Krishi Pragati Foundation (KPF)

About(KPF)

- Non-profit organization supported by Tata Trusts .
- Specializes in fresh agri produce supply chain and helps to bridge the gap between farmers and consumers.

Objective of KPF. Is to maximize producers' share in the consumer price through establishing direct market linkages for farmers without any intermediaries.

Use of cloud by KPF. KPF is using **SourceTrace** to give digital solution.

- SourceTrace is a global leader in providing digital solutions to agriculture and food businesses.

Case study: Krishi Pragati Foundation (KPF)

SourceTrace gives SAAS solution and agri value chain management software make farming sustainable, supply chains efficient and bring transparency and traceability into food trade across 32 countries.

➢**CLICK of a button.** Available on click of a button of Smart phones/tablets /intelligent mobile devices are fast replacing manual, paper-based methods in today's global supply chains.

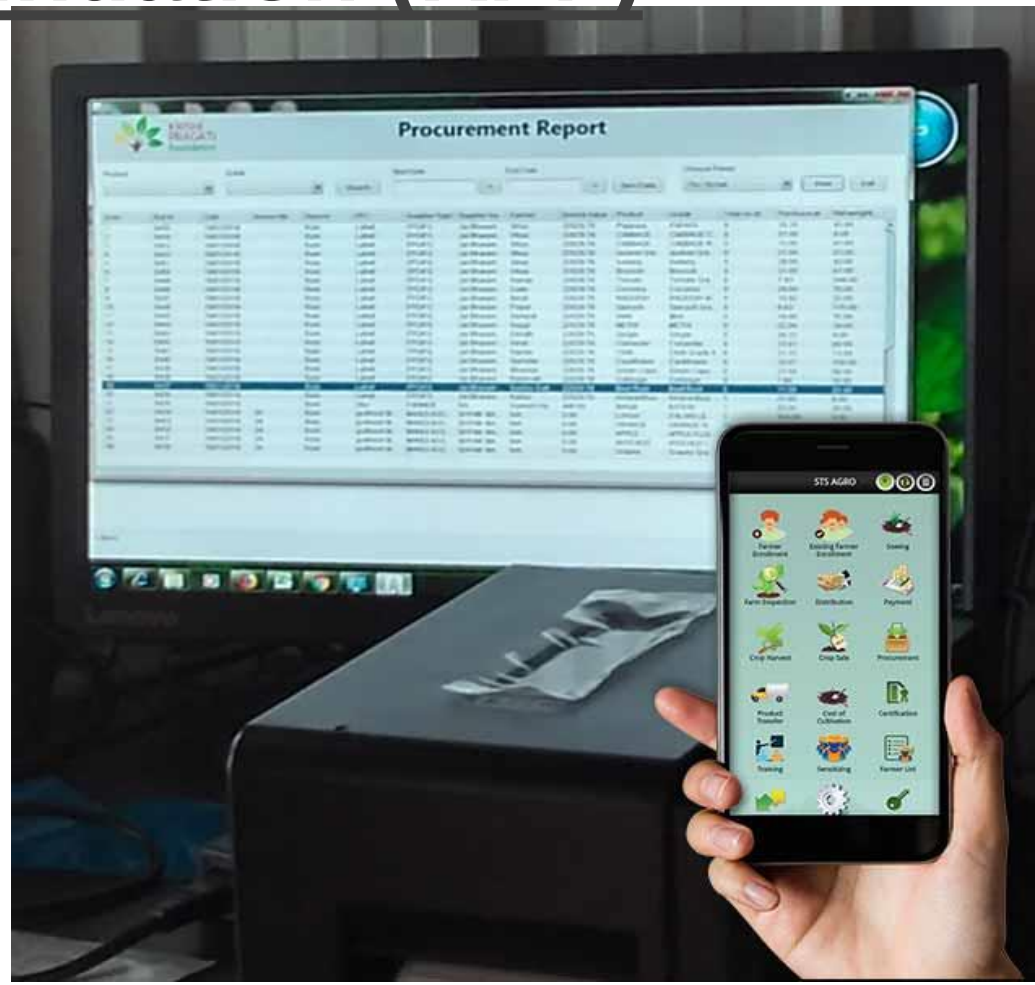


Image Source: www.sourcetrace.com/

Digitisation of supply chain. It means collecting and recording all end-to-end data of the company instantly and digitally, which also makes this data retrievable at any point of time.

- Digitisiation of supply chains means that companies will have greater data gathering, reporting and analytics capabilities.

- Digitisation allows a basis for sharing goals and values instantaneously and continuously across organistions

- In short, digitization of the supply chain has the potential to dramatically lower costs, increase product availability, and even create new markets unknown or unavailable prior to the availability of key technologies

USE OF CLOUD COMPUTING BY KPF

- **Advantage.**
  - Decreases manpower requirement
  - Breaking down collaboration barriers between organisations
  - Paperless
  - Information is available in real-time and can be shared freely
  - Creates a visible, transparent and ‘agile’ supply chain.
  - Bridging gap between farmer and consumer.
  - SourceTrace application generated a ‘QR code’, which appears as a sticker on the packages. A customer interested in tracing the source of the produce can simply scan the code and avail information of its source.

Image Source: www.sourcetrace.com/

Conclusion

- The Cloud computing is a game changing phase of IT that is not only impacting the way computing services are and will be delivered but also the way in which users will use IT.

- A move to the Cloud, however, requires a well planned strategy as there are many business and technical constraints that need to be mitigated.

Image Source: www.sourcetrace.com/

References

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