

ICT

Online session
For MES officers – April 2020
8th April 2020

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MES [Online]

ICT

- 2 days of interactions spread over 3 plus hours.... We will explore DIVERSE topics on ICT
- We will look at ICT from many angles
 - Technology, [of course!]
 - Governance & operations
 - Economics / Finance
 - And if time permits, Risk

MES [Online] ICT

- Outcome / learning are hoped for
 - Understanding of ICT trajectories
 - An appreciation [and concern] for the complexity of the modern day ICT ecosystem
 - A managerial perspective of ICT

Please have **Kahoot.it** window open on your web browser

- We will break the monotony through Kahoot based SIMPLE quizzes
 - **You will be given a Quiz number** to enter. You can obtain it from my screen
 - Enter your name in short form or your roll number
 - Each question will be of 20 / 30 seconds duration
 - **The Question WILL BE shown only on MY SCREEN.**
 - **You will be shown only the answer choices on your browser**
 - Click the answer of your choice

CHAT window exercise – 2 minutes

What factors will you consider / assess / Study before you will recommend **xyz** software to your **organisation**? [*Bullet point form answer*]

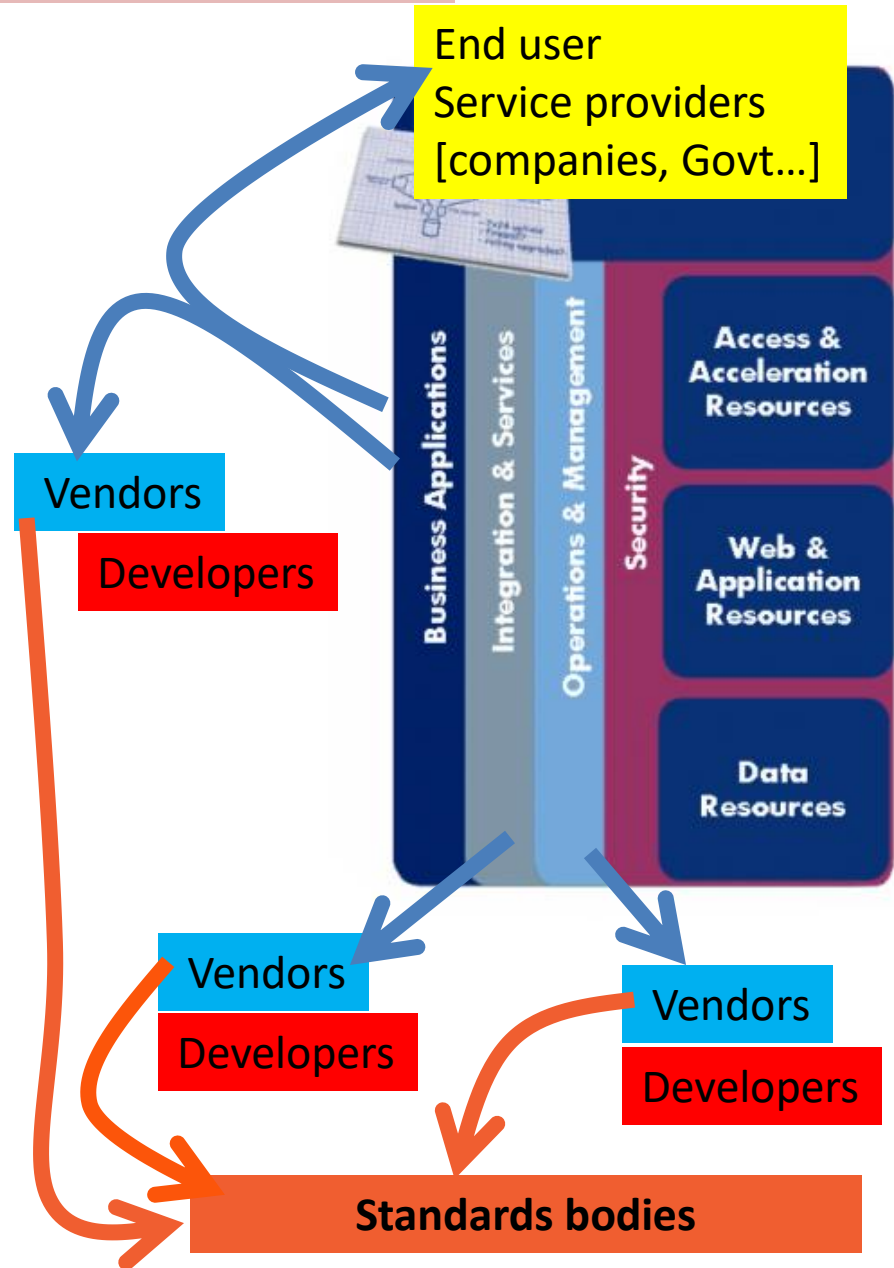
[xyz can be Project Management, logistics, Architectural design...your choice]

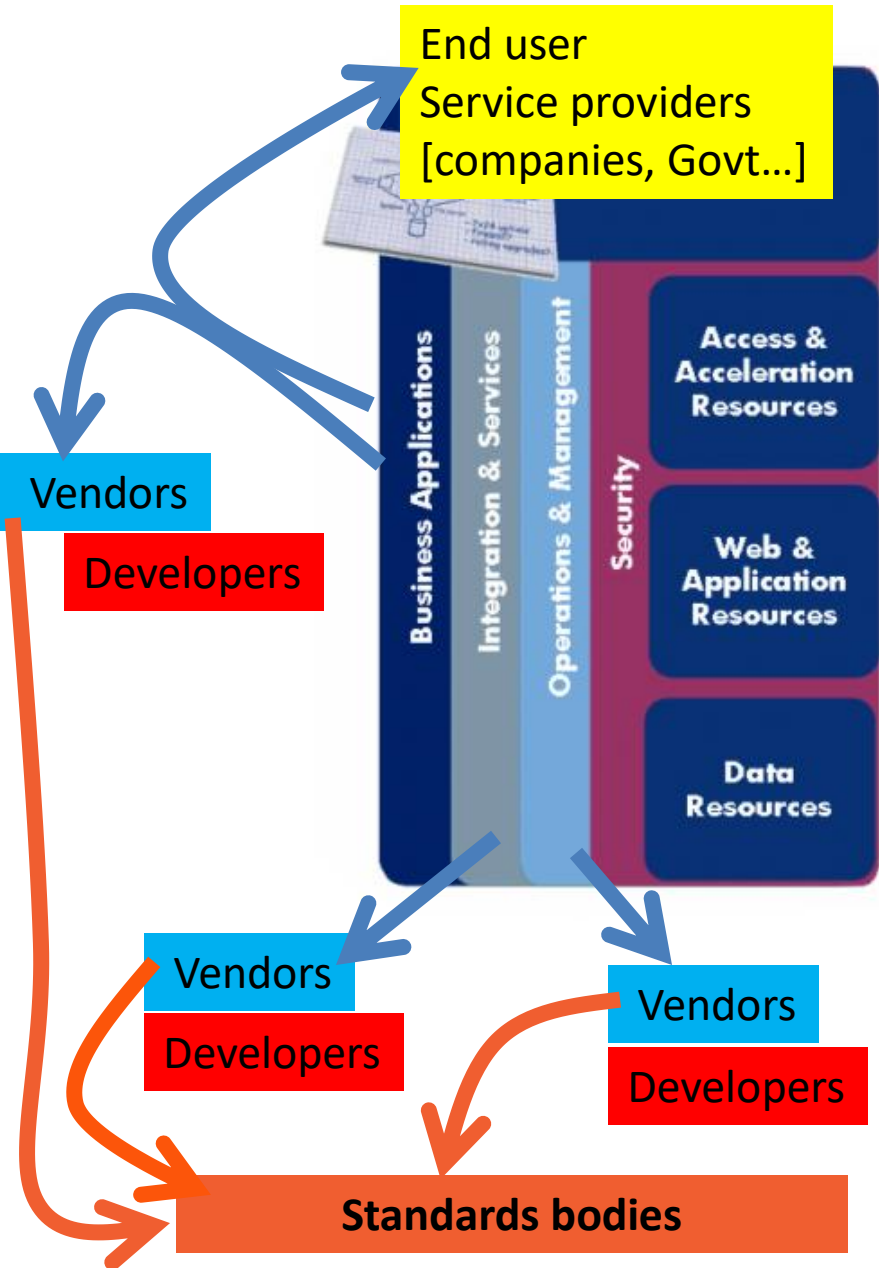


- An example of a business application – Project Management software

Quiz-1

STAKEHOLDERS



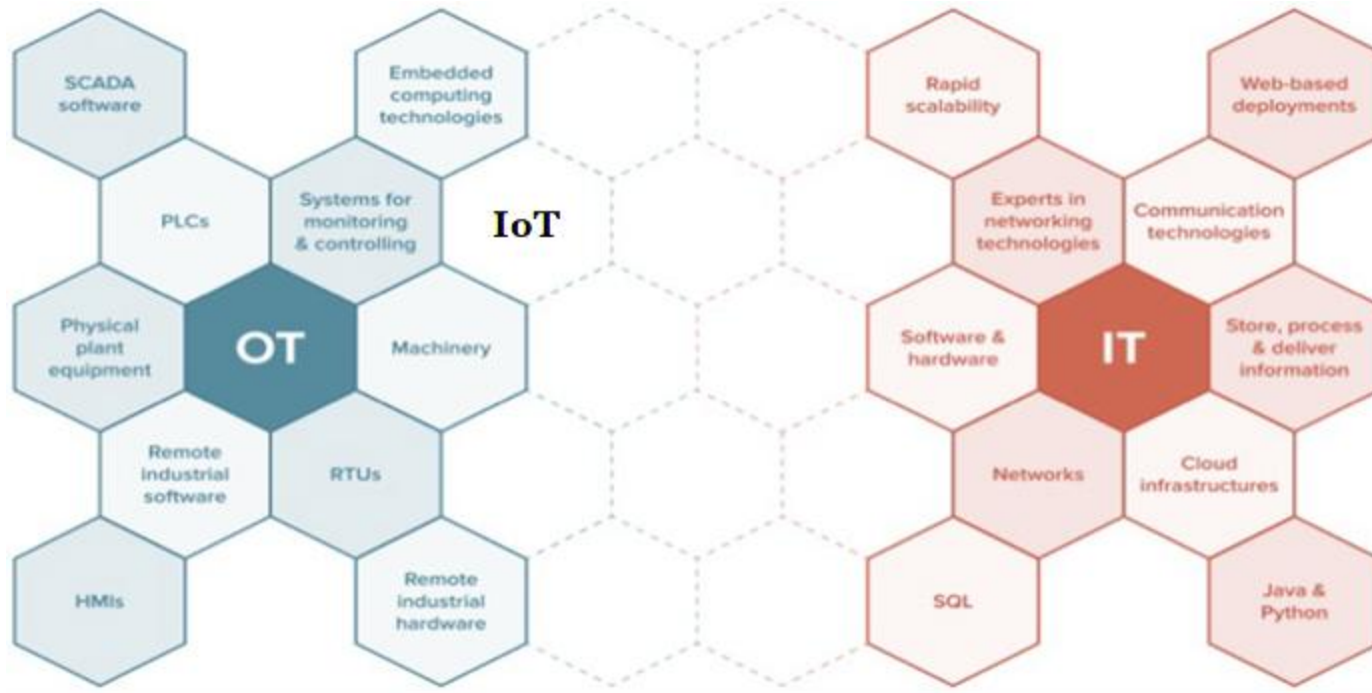


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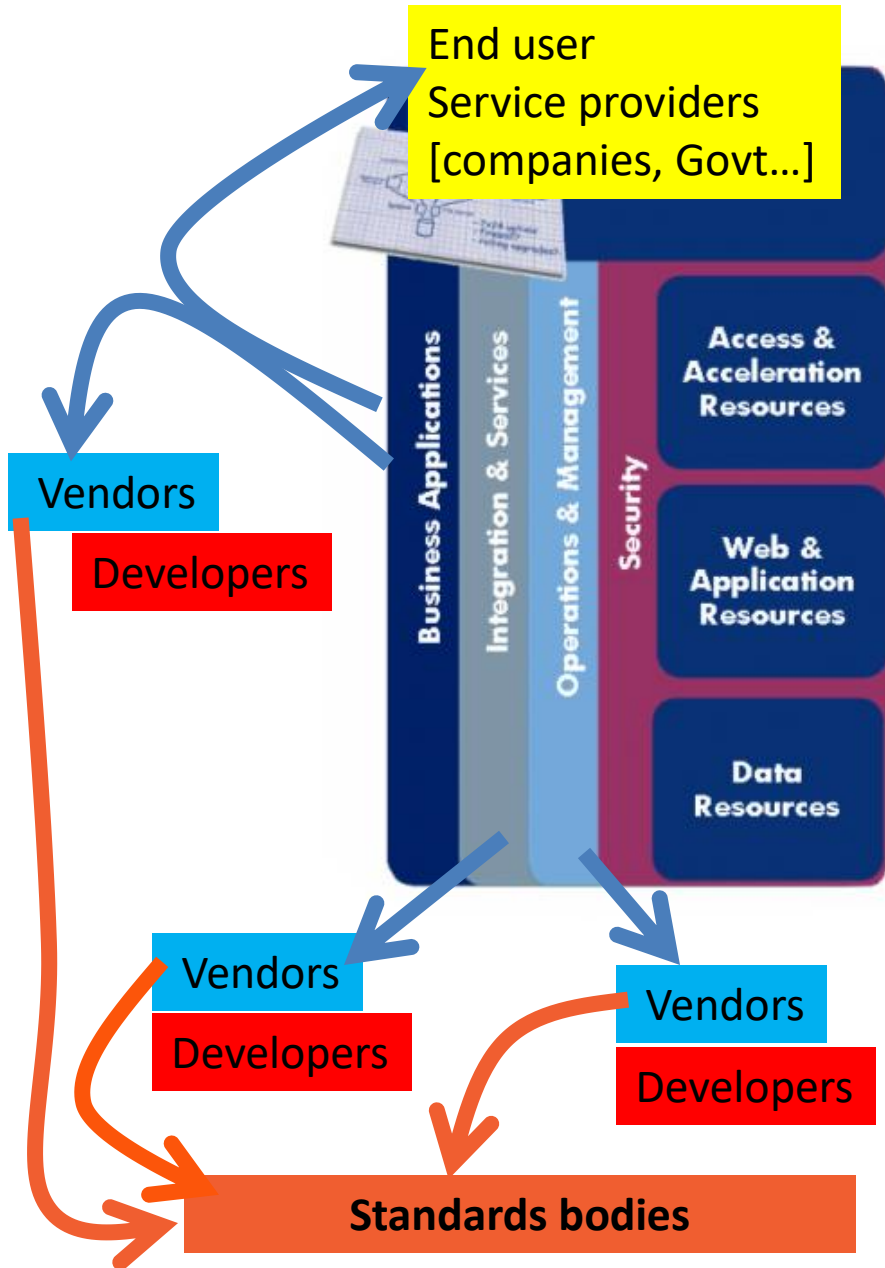
Manufacturers

Governments / Regulators

New addition to the Information source



[OT] Operations Technology Vs [IT] Information Technology



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Governments / Regulators

As Processes change Data change, and **MANY** other things are forced to change

- Take for instance, this lock down situation
- An organisation [Yours???] now conducts all its key meetings and concludes all its critical decisions over the net
- Can an organisation's network cater to this new reality?
- **ICT DECISIONS ARE COMPLEX**

Purpose of the Network

- Earlier, Data Only
 - Now, Data and Voice
 - Now, Data, Voice and Video
- Earlier, Off-line application [perhaps]
 - Now, On-line application
 - Now, Combination of on-line and off-line application
- Connecting Multiple Departments/
organisations electronically ***[not just network but compatibility / inter-operability challenges]***

Network Availability

- Duration
 - Earlier, Fixed Duration
 - Office hours
 - Now, 24 hours
- User characteristics
 - Number of Users
 - Concurrency
 - Peak load, average Load
 - User side infrastructure
 - User skills
- User Mobility
 - Fixed
 - Mobile within a known boundary
 - Mobile within populated area
 - Absolute mobility – anywhere on earth
 - Or beyond earth!!

Bandwidth Requirements

- Known
- Approximately known
- Unknown, Open ended
- Symmetric OR Asymmetric traffic?

QoS Requirements

- Up-time
- Delay, Jitter
- Call acceptance/rejection rate
 - Can user wait? How long?

Technologies

- Connectivity - LAN
 - Ethernet, Frame Relay, ATM, WiFi, L2, L3 Switching
- Connectivity – WAN
 - PSTN, ISDN, Wired Broadband, Wireless Broadband – WiMax, 2G, 3G, 4G, GPRS, SMS, MMS, 5G?
 - Fixed Leased Lines
 - MPLS, Software defined networking, Satellite Communication
- Protocols
 - IPv4, IPv6, TCP, UDP, Unicast, Multicast, IPSec, SSL

Security

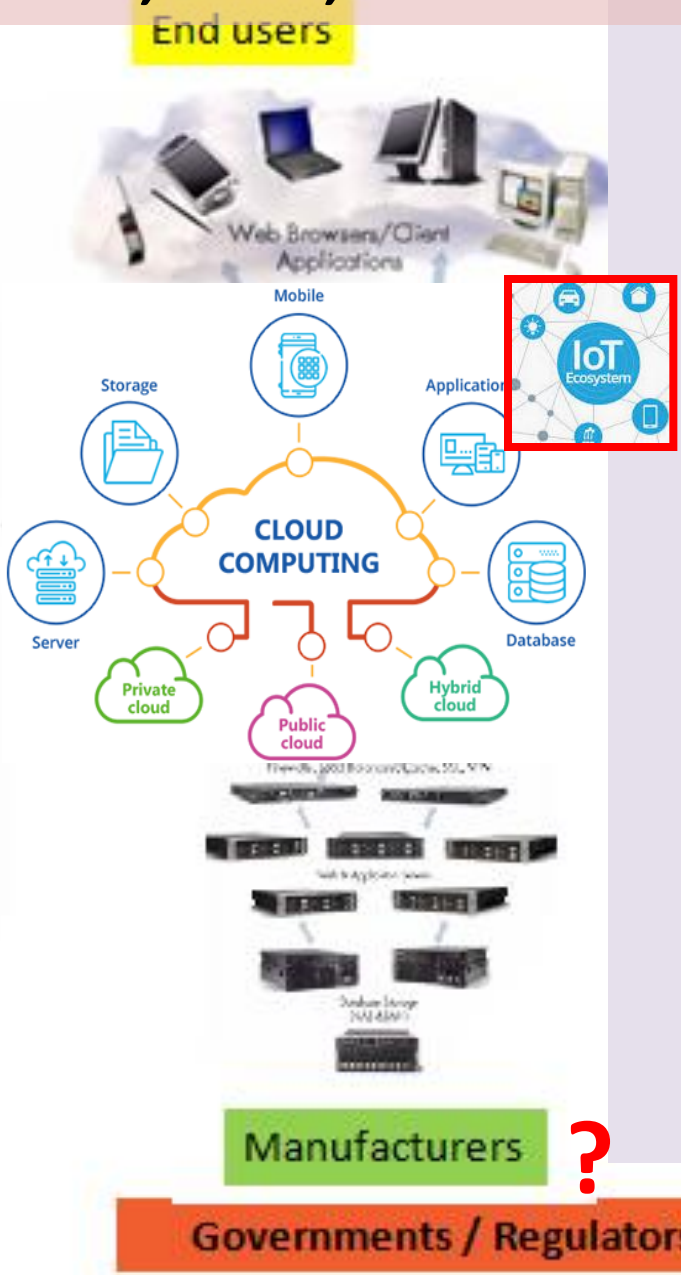
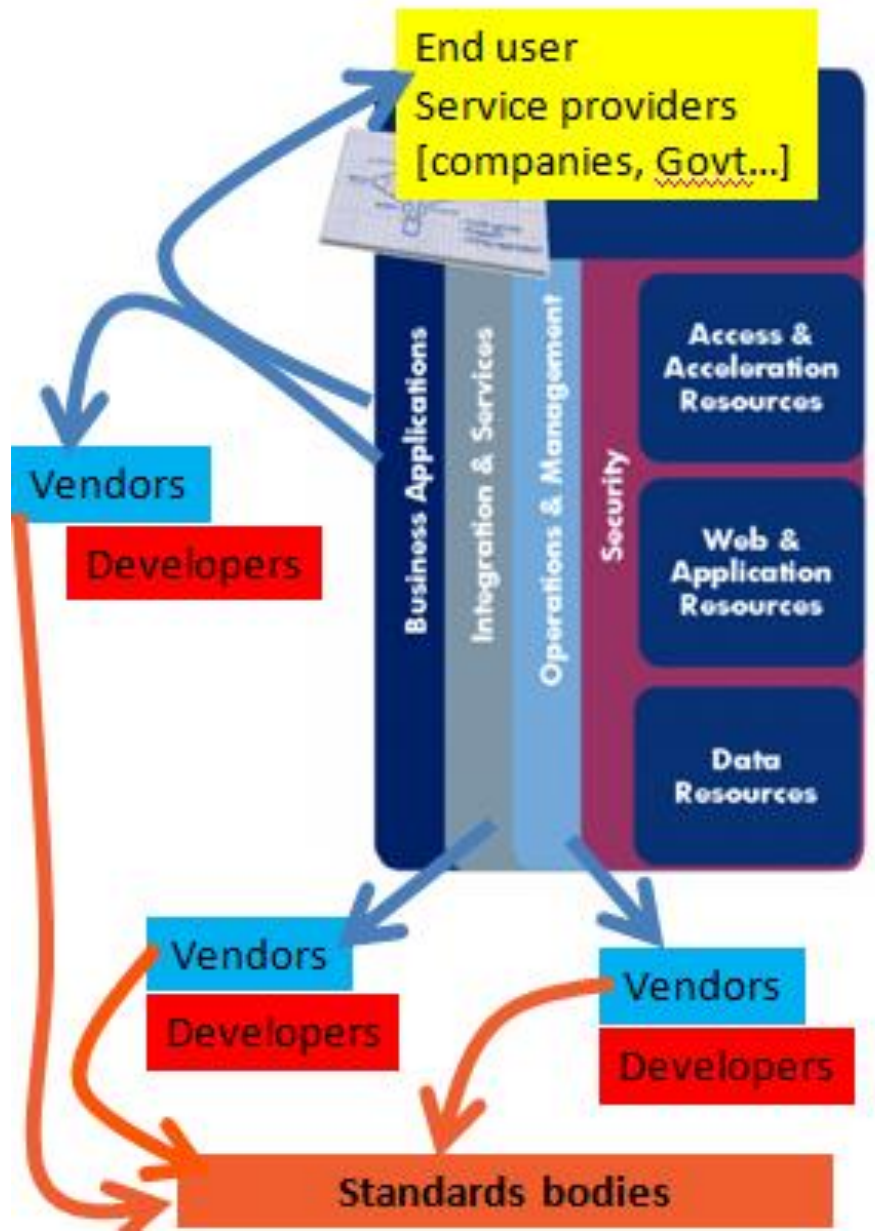
- Firewall
 - Packet Filtering, Stateful, Application Proxy
 - Hardware, Software
- IDS, IPS, VPN, UTM
- Content Screening Gateways
 - Virus, Spyware, User Data
- Authentication
 - Open LDAP, Active Directory, etc
- NAC, VLAN, Cryptography

What should we do now?

- Enhance / modify / Invest in additional technology?
 - Funds?
 - Time to develop?
 - Time to implement?
 - Expertise?
 - What to do about interoperability / compatibility issues?
- NTPC

How about looking at Cloud?

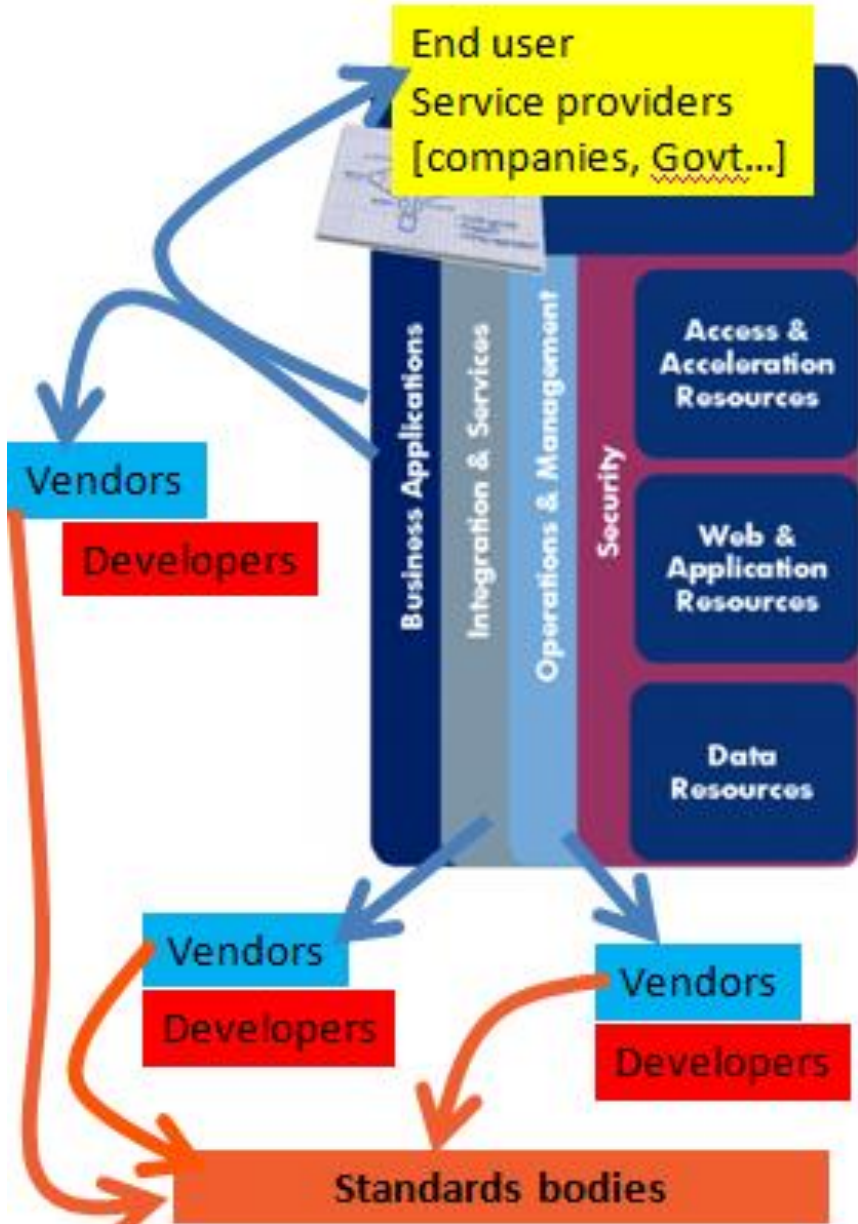
Decision Choices IaaS, PaaS, SaaS



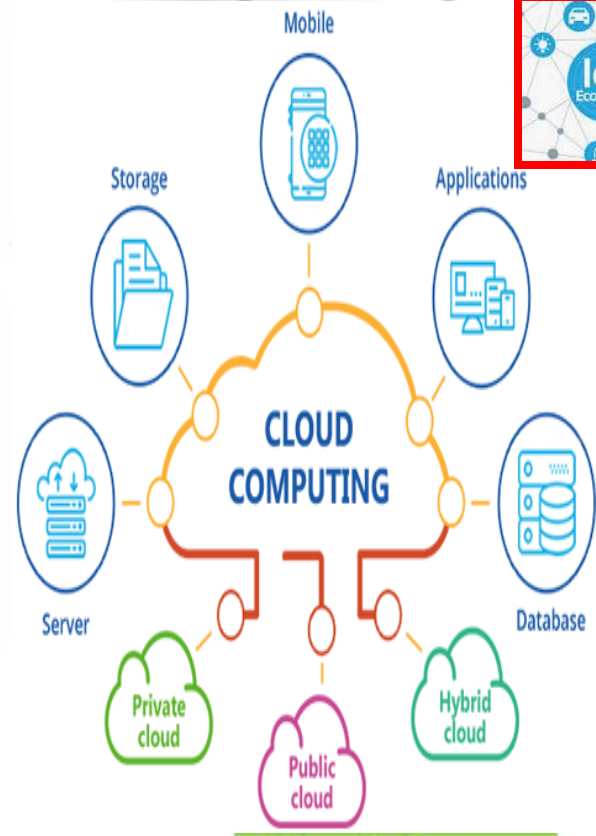
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Everything on the cloud?

- It is not unthinkable to move more or less entirely to the cloud
- What will happen to all the servers etc that I earlier had invested in?
 - Monetise it?



End users



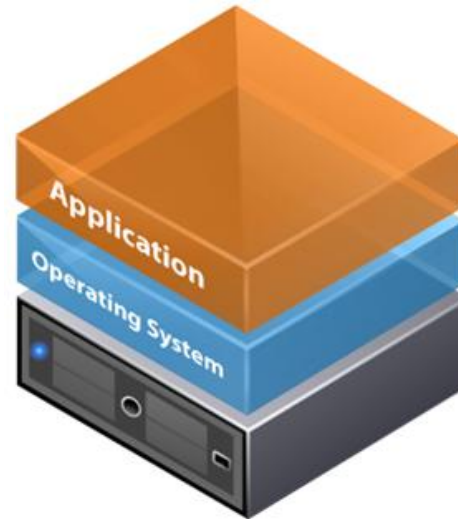
Manufacturers ?

Governments / Regulators

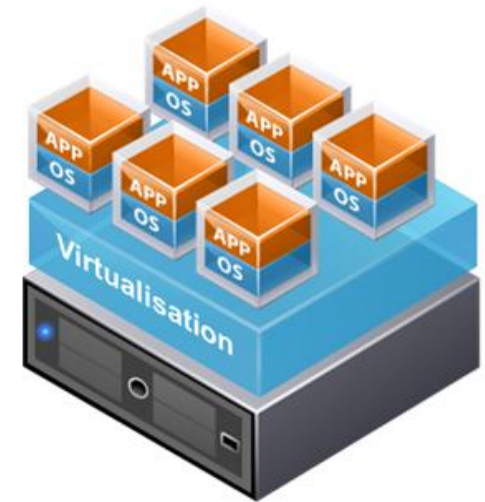
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The cloud vendor does not create separate physical H/W, S/w silos for every client

- Virtualisation?



Traditional Architecture



Virtual Architecture

- Point to ponder: If more and more organisations migrate to the cloud, how will it impact the ICT hardware and Software manufacturers and Consultants

Possibly the biGGest challenge?

- SaaS etc often make sense when they are “commodities”
- Whether an artefact of ICT is a “commodity” or a “unique utility” determines everything from its implementation complexity, interoperability, costs, project success / failure, **sustainability**
- “We are different / unique” is the most common refrain heard within the ICT sector
- **The trouble?: Uniqueness is often forced and imagined for political, control and other reasons**

Buy Vs Rent Vs Partner

- Earlier, I had bought my own servers, applications, printers, routers, firewalls etc etc
- If I were to use the cloud, I will probably pay a periodic fee depending on my usage [something like paying variable rent]
 - Of course, such an arrangement is possible even without a cloud
- How about entering into a “Partnership”? How will this work? What advantages might it bring? And what risks?

If you are “unique” ...

- COTS may not be an option
- Turnkey might be the only way to go
- In today's internet / social / viral media environment and after more than 3 decades of ICT, how unique can you really [or afford to] be – WITH TRANSACTION SYSTEMS?