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THEME: "Reducing e-Waste Generation through Cloud Computing Technology Services"

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Order of Presentation

- *Introduction*
- *Objectives*
- *Methodology*
- *Results and Discussions*
- *Conclusions*

Introduction

- Cloud Computing Technology has a range of benefits:
  - high efficiency & reliability.
  - often not consider the role it can play in reducing the amount of electronic waste (e-waste) generated.
- E-waste is the term used to describe old and end-of-life electronic appliances such as computers, laptops, TVs, DVD players, mobile phone, mp3 players etc.
- Every e-waste is generated from every manufactured and sold electronic product - every produced electronic good will always end in waste, and majority either in landfills or in illegal and informal recycling facilities.

- Recent researches have shown that the volume of e-waste is increasing between 3% and 5% a year, almost three times the municipal waste stream in many places;
- 70% of the heavy metals, including mercury and cadmium found, in landfills believed to come from electronic equipment

Objectives

- To address the proliferation of e-waste through checking manufacture of consumer electronic devices that have alternatives sources to provide their services.

Methodology

Qualitative -> reports, magazines, journals, etc..

Results and Discussions

- Formal recycling is a challenge (for developing world) because it is expense process, with no real business sense
- The idea in the paper is to provide consumer service via cloud computing technology
- The cloud computing architecture provides services via the internet by on-demand & pay-per-use basis to gain access to a pool of shared resources notably networks, storage devices, servers, services and applications
- Without physically acquiring them.

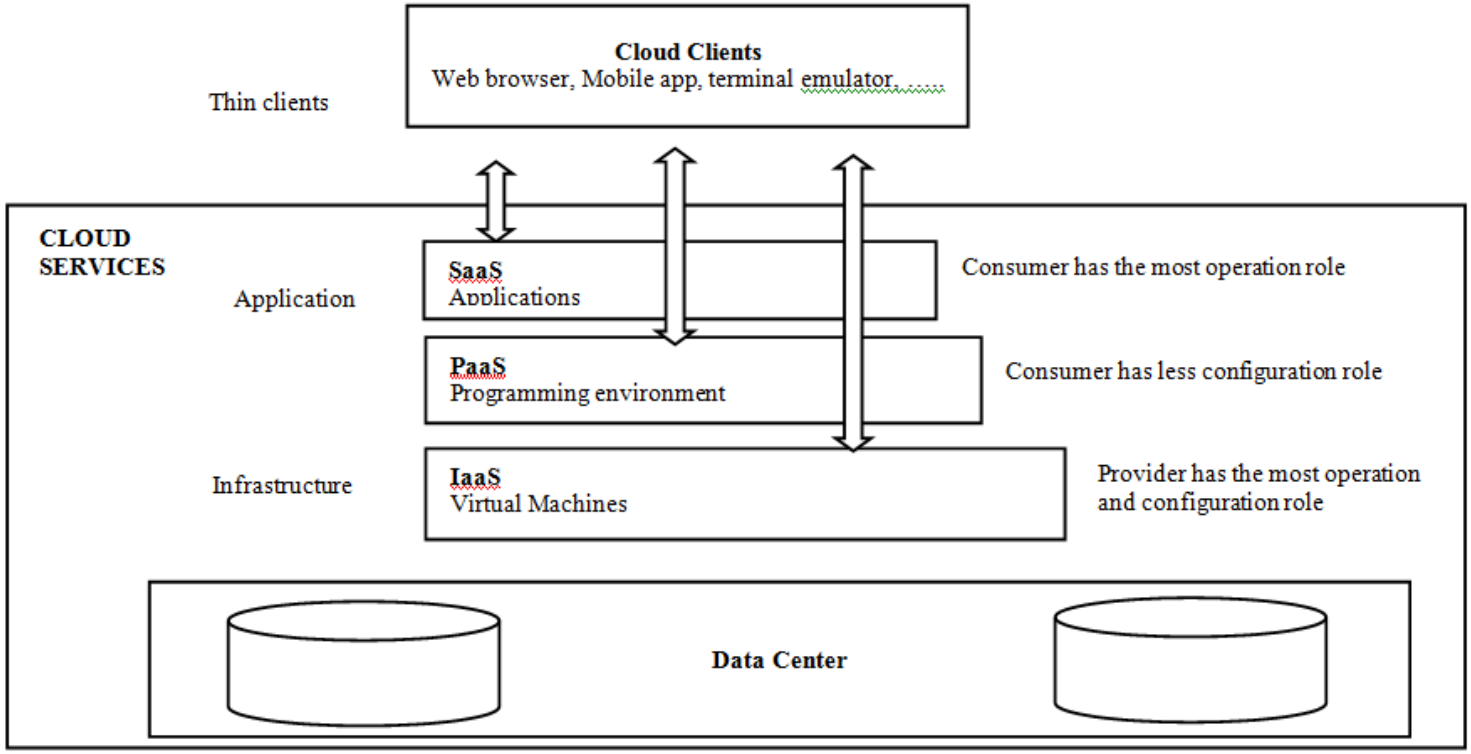


Fig. 1: Cloud services architecture

E-waste Generation Reduction

- *Quantities of shipped devices (q) ->Computers and Laptops (PCs), Web Servers (SVs), Television sets (TVs), Tablets (TBs), mobile phones (MPs);*
- *Total annual shipment of particular devices(q_{yi})*
- *Quantities of replaceable devices (l_{qi}) -> PCs, SVs, tablets; TVs*
- *Annual quantities of required devices (r_{qi})-> mobile phones.*
- *Total annual shipped devices (Tq_{yi});*
- *Annual individual device's effective weight (t_i);*
- *Total Average weight of individual devices (Tt_i)*
- *The transaction year (yi) -> 2012, 2013, 2014, 2015;*

$$Tq_{yi} = \sum (q_{yi}) \quad (1)$$

$$Tl_{qi} = \sum (l_{qi}) \quad (2)$$

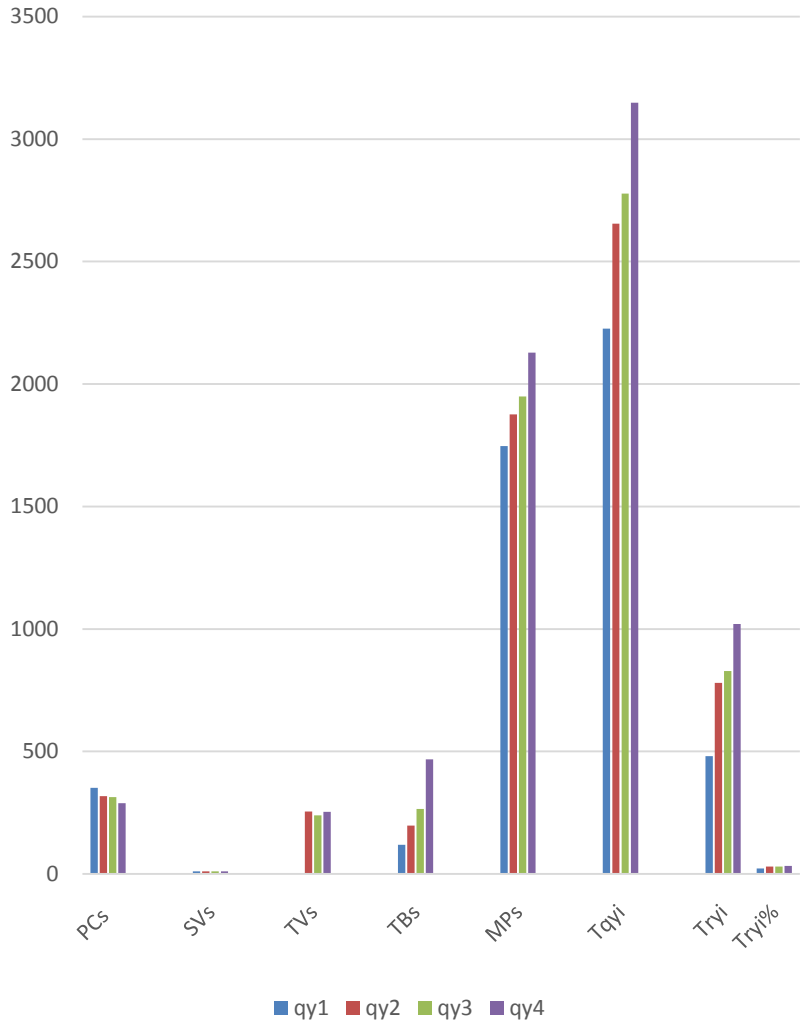
$$Tr_{yi} = Tq_{yi} - Tl_{yi} \quad (3)$$

$$Tt = \sum (t_i) \quad (4)$$

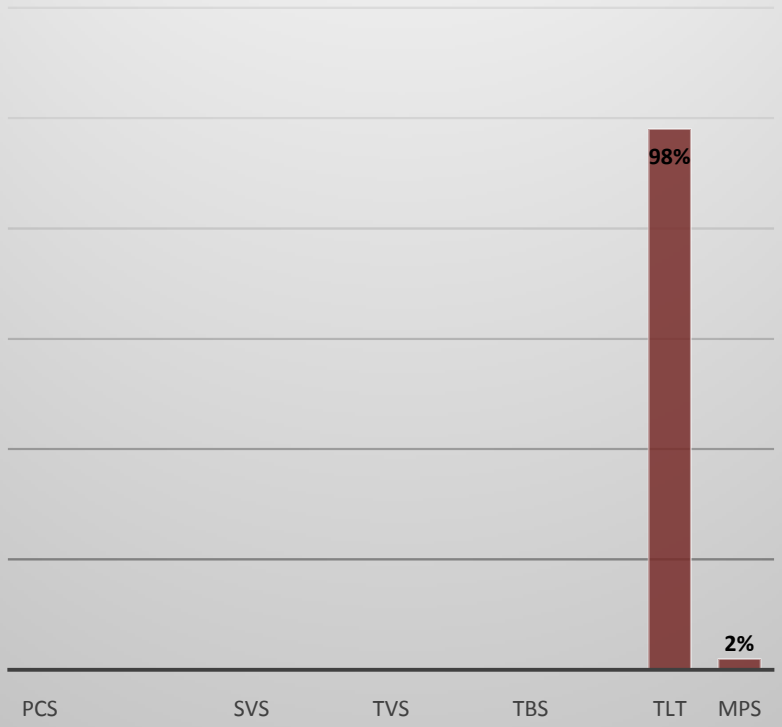
Table 1: Worldwide devices shipment by segments (millions of units)

Device Type	q_{vi} (Units in millions)					Unit Average weight (kg)	t_i (kg)	Weight contributed (%)
	q_{v1}	q_{v2}	q_{v3}	q_{v4}	Total			
PCs	350.95	317.3	313.68	288.25	1270.18	28.55	36,263.64	
SVs	9.89	9.89	10.09	11	40.87	70.3	2,873.16	
TVs	247. 0	255.0	238.5	253.1	746.6	25	18,665.00	
TBs	119.53	197.202	265.731	467.951	1050.413	1.6	1,680.66	
Tlt							**59,482.46**	**98**
MPs	1,746.2	1,875.774	1,949.722	2,128.871	7700.543	0.192	**1,478.50**	**2**
Tq_{vi}	**2,226.6**	**2,655.2**	**2,777.7**	**3,149.2**				
Tr_{vi}	**480.40**	**779.43**	**827.98**	**1,020.33**				
$Tr_{vi\%}$	**22**	**29.4**	**30**	**32.4**				

Graph 1: Contribution of Mobile phone to e-waste generation



Graph 2: Volume in weight contributed by mobile phone vs others



Conclusion

Technology is potentially bound to provide more e-waste, but is also providing solutions for it. It is not necessary to have user all the user devices for services that could be provided via clouding computing technology.

Small hand held devices are becoming sufficient, to access the exact services over cloud computing to reduce about 98% of the e-waste in terms of weight.

Acknowledgements:

Consider legislations that limit unnecessary acquisition of consumer devices for whose services cloud could provide

THANK YOU