

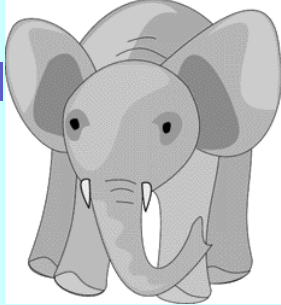
Ubiquitous computing: *The Next Big Thing* or *Just Hype As Usual?*

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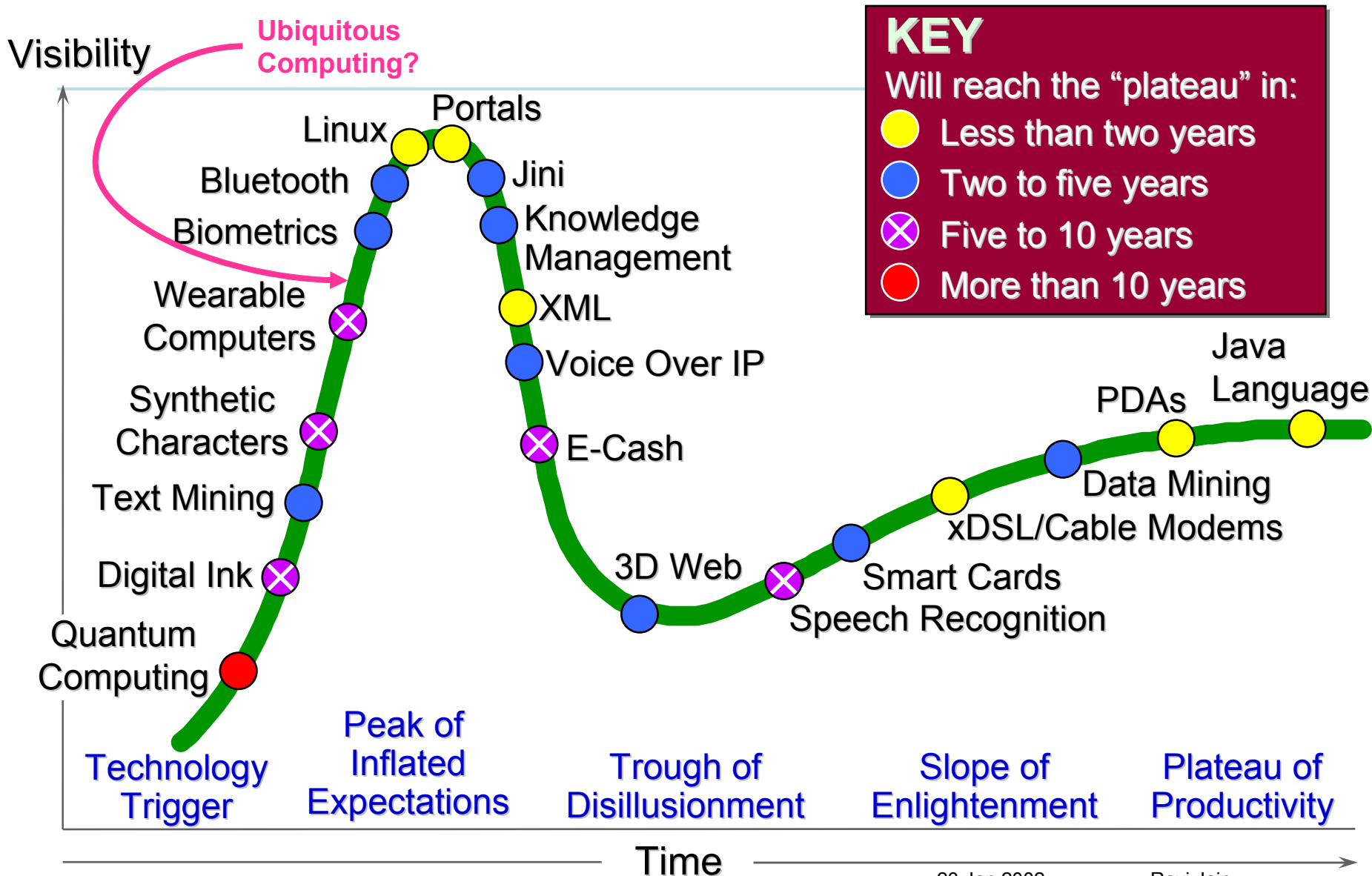
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Defining the elephant

		Mobility: Low	High
Pervasive* -ness: Low High	Standard Computing e.g. PC	Mobile Computing e.g. Wireless PDA Service is provided while moving but does not (intentionally) change with movement	Ubiquitous Computing e.g. Personal Tour Guide 
	Pervasive Computing e.g. Smart Home Builds incrementally dynamic models of its context (environment) and provides service accordingly	(A red arrow points from this cell to the Ubiquitous Computing cell)	

*Pervasive = Embedded + Widely Distributed + Adaptive

The Gartner Hype Cycle: Yr 2000



One Challenge: Energy

- Batteries: ~ 1 J / cubic mm
 - Increasing by only 10% over foreseeable future
 - Environmental issues
- Use less
 - Has to be integrated into *all* layers of the stack
- Using other sources
 - Fuel cells: 10-40x the energy storage density of Lithium-ion, but loses a lot in conversion to electricity
 - Solar: 15 mW / sq cm (outdoor mid-day) to 10 uW / sq cm (office lighting)
 - Human: Direct (e.g. hand-cranked radios) or Parasitic: Piezoelectric (sneakers), keystrokes, wrist moves etc
 - Vibration, temperature gradients
 - MEMS
 - Inductive power transfer e.g. RF ID, Splashpower
 - *Few of these sources are yet widely commercialized*

Projections

- The social issues will be harder to solve than the technical ones
 - Privacy
 - Loss of tranquility
 - Organizational change
 - *Grand plans inspire great resistance*
- Ubiquitous = Pervasive + Mobile
- The pervasive computing issues will be harder to solve than the mobile computing ones
 - Model building is hard; doing it dynamically is even harder
 - The mobile computing and communications issues have a long history of development by a large industry with deep pockets
 - Business model, business model, business model
- “Be extremely wary of predictions, especially predictions about the future” – Mark Twain