

# COMS W4170

## *Predicting the Future (Past and Present)*

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December 6, 2018

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## *Ubiquitous Computing (Ubicomp)*

M. Weiser, 1990s [web.archive.org/web/20180526001207/http://www.ubiq.com/hypertext/weiser/UbiHome.html](http://web.archive.org/web/20180526001207/http://www.ubiq.com/hypertext/weiser/UbiHome.html)

- AKA pervasive computing
- One user : **many invisible computers**
  - Invisible → "...make a computer so imbedded, so fitting, so natural, that we use it without even thinking about it"
  - Analogy to motors
- E.g., tabs pads boards
  - number: 100s 10s few
  - size: inch- foot- yard-
- Wireless
- Today: smartwatches, tablets, "big" displays



"the age of calm technology,  
when technology recedes into  
the background of our lives"  
— M. Weiser

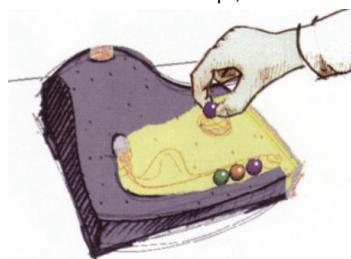


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# *Tangible User Interfaces*

- “Employ physical objects, surfaces, and spaces as tangible embodiments of digital information.”  
— H. Ishii

Marbles represent phone messages  
D. Bishop, Marble Answering Machine concept, 1992



vimeo.com/19930744

## Physical blocks ("phicons") represent buildings, tools

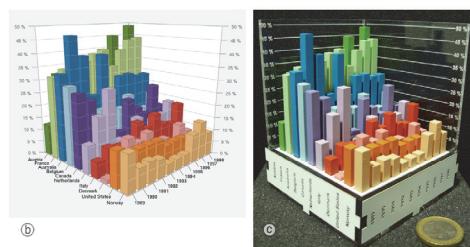


<https://doi.org/10.1145/263407.263551>

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## *Tangible User Interfaces*

- Data physicalization
    - Y. Jansen et al., *CHI 2013*  
<https://doi.org/10.1145/2470654.2481359>



Compared 3D virtual and physical visualizations.  
Physical bar charts outperformed virtual ones.

Physical bar charts outperformed virtual ones.  
Physical bar charts had the advantage of being “touchable.”  
Fingers were used to touch bars as visual and memory aids

List of Physical Visualizations and Related Artefacts	
<i>This is a (dynamical) list of physical visualizations and related artefacts, presented in a timeline. If you have any questions about the entries or would like to add one, feel free to post a general comment or if you know of another interesting physical visualization, please let me know.</i>	
<a href="#">Physical visualizations</a>   <a href="#">Interactive visualizations</a>   <a href="#">Physical models</a>   <a href="#">Measuring instruments</a>   <a href="#">Galleries</a>	
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<p><b>5500 BC – Mesopotamian Clay Tokens</b></p>  <p>The earliest data visualizations were likely physical: by arranging stones or pebbles, and later, clay tokens, in specific patterns, early humans could represent numbers, dates, and other information. These tokens were often inscribed with symbols representing different quantities, such as sheep, goats, or grain. They could be used for trade, taxation, or even simple accounting, in some form of mercantile, retail, and administrative contexts. [1]</p>	
<p><b>6000 BC – Inca Quipus</b></p>  <p>Quipus were complex systems of knotted ropes that were used in South America as a storage device and a means of communication in the Andes civilization. One type of knot could represent a number, while another represented a letter of the alphabet. Their meaning mostly remains a mystery today, but they could represent place, relative position of events, knot types, and perhaps even names of people, animals, and geographical features. [2]</p>	

## List of Physical Visualizations

<http://dataphys.org/list/>

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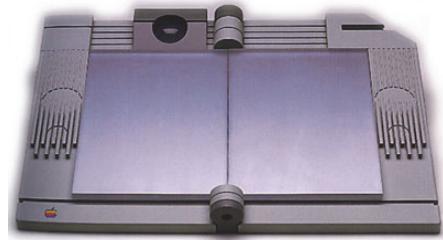
## *Past Attempts to Predict the Future*

[Additional slides not used in class]

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## *Apple Knowledge Navigator 1987*

- 2011 (as predicted in 1987)
- Bowtied intelligent agent
- Folded display
- Videoconferencing
- Real-time end-user design of animated presentations



<http://www.digibarn.com/collections/movies/knowledge-navigator.html>

Apple Knowledge Navigator, 1987

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## *Sun Starfire* 1992

- 2004 (as predicted in 1992)
- Bruce Tognazzini et al.



<http://asktog.com/starfire/>

Sun Starfire, 1992

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## *Alternate Visions of (Past) Future(s)*

- NTT DoCoMo Vision 2010 (ca. 2000)
  - <http://www.youtube.com/watch?v=ae-Ssclu5A4>
- NTT DoCoMo Mobile Life Story (2006)
  - <http://www.youtube.com/watch?v=eS0P16lyXOw>
- HP Labs mscape “Roku’s Reward” (2007)
  - <http://vimeo.com/45472894>
- Microsoft Office Labs Future Vision Montage (2009) [predicting 2019]
  - <https://www.youtube.com/watch?v=8Ff7SzP4gfg>
- Keiichi Matsuda, Augmented (hyper)Reality: Domestic Robocop (2009) [dystopian future]
  - <http://vimeo.com/8569187>
- Project Glass: One day (< 2012) [concept, not actual product]
  - <https://www.youtube.com/watch?v=9c6W4CCU9M4>
- Keiichi Matsuda, Hyper-Reality (2016) [dystopian future]
  - <http://hyper-reality.co>



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