Panel Discussion @ DMSN

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How successful has DMSN been?

- Streambase?
- RFID?
- CitySense?
- Monitoring – location tracking (vessel, taxi, etc)?
- Smart-*
- Too early to evaluate? We're only 10-year old?

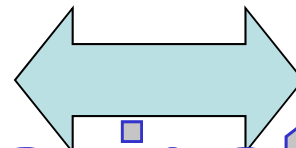# Significance of Recent Advances

- Push by technology
  - Application-specific sensing devices
    - Medical, eHealth, transport
  - Smartphone
    - Mobility
  - Cloud?
- Pull by vendors

What is Co (existent) Space?

CoSpace Mall

CoSpace Museum

Navigation System

Location-based Games

Virtual World

Physical World

What is Co (existent) Space?

The Claremont Report on Database Research (2008)

In both of these areas, large amounts of data are flowing from users, being synthesized and used to affect the virtual and/or real world. These applications raise new challenges, such as a need to process heterogeneous data streams in order to materialize real-world events, the need to balance privacy against the collective benefit of sharing personal real-time information, and the need for more intelligent processing to send interesting events in the co-space to someone in the physical world. The programming of virtual actors in games and virtual worlds requires large-scale parallel programming, and declarative methods have been proposed as a solution in that environment as discussed in Section 2.2. These
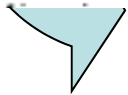
bxp45915 www.fotosearch.com

Physical World

Virtual World

U.S Broader Research Agenda and Priorities

President's Council of Advisors on Science and Technology

Networking and Information Technology Research and Development

- ## PCAST/NITRD report [August 2007]
  - Dan Reed and George Scalise
  - 8 priority areas listed, with the recommendation that the first 4 get disproportionately larger funding increases.

- ## #1 Priority: Cyber-Physical Systems
  - Our lives depend on them.

What's in CoSpace?

- Lots of data (& data types) – static and dynamic Update-intensive

- Lots of sensors Sensor DB + data streams

- Lots of events Event monitoring

- Lots of users Distributed/heterogeneous DB

- Lots of queries Search + data retrieval + query processing

- Lots of interactions Real time processing

- Lots of research issues?

Lots of Research Challenges

- Data fusion over heterogeneous data sources
- Distributed/Parallel/Cloud architecture
- Database Engines
  - Storage manager
  - Query processing and optimization
    - Space-aware
  - Indexing
  - Buffer management/caching
    - Space-aware
- Data Consistency & Accuracy