



Augmented Reality

Technology Innovation and Standardization

II

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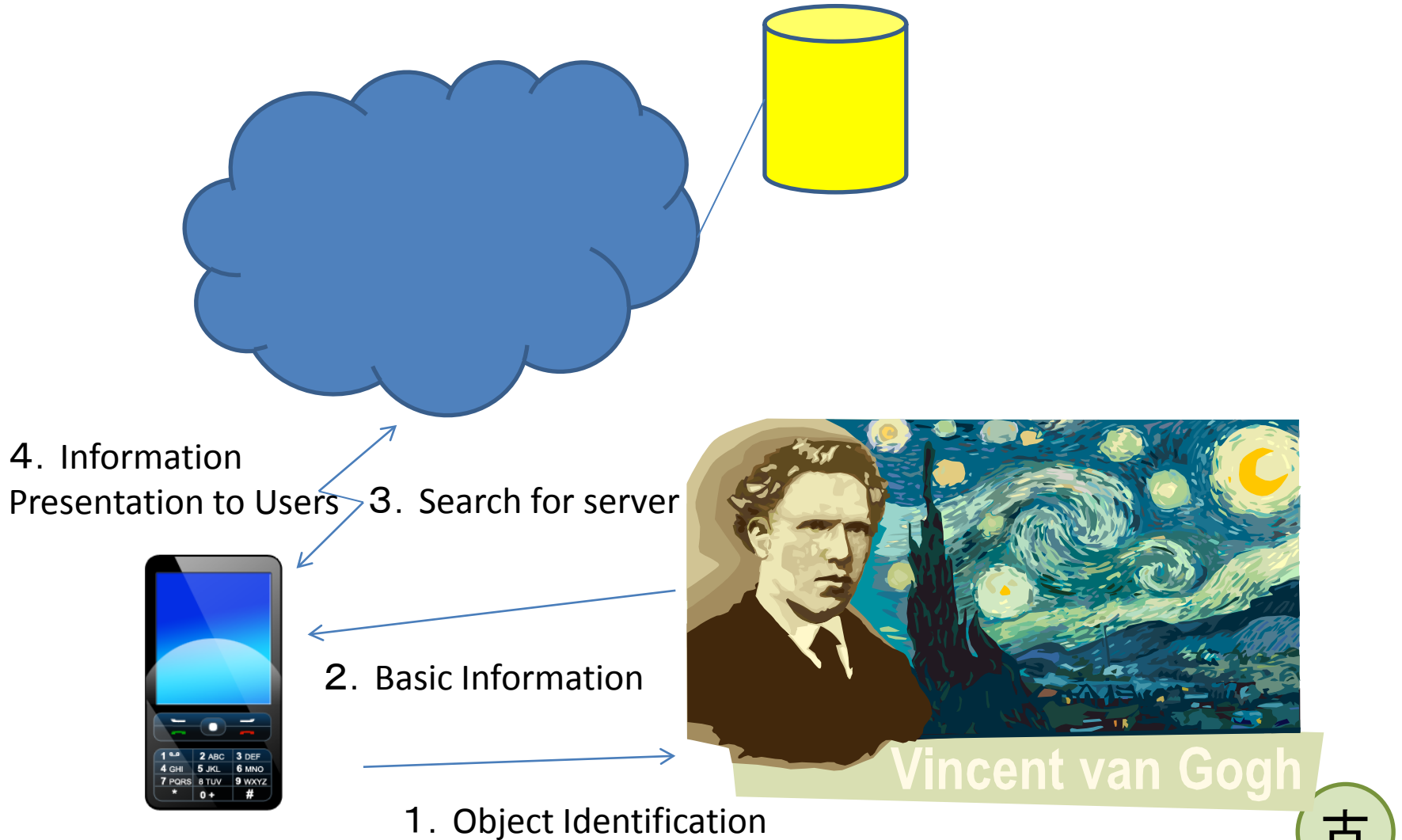
What is Augmented Reality

- Computer generated information is attached on the real world and presented to the user
 - I take this definition
- In the narrow sense, GC graphics are superimposed on the camera display to explain the objects
 - Many researchers coming from Virtual Reality field define AR in this way





Elements for AR





Ultimate image of AR



Augmented information will be shown on the glass or on a front window of a car



Real time menu translation



NTT docomo
CEATEC 2013, Japan





Google Glass



Under field test in San Francisco area



Google glass (1)

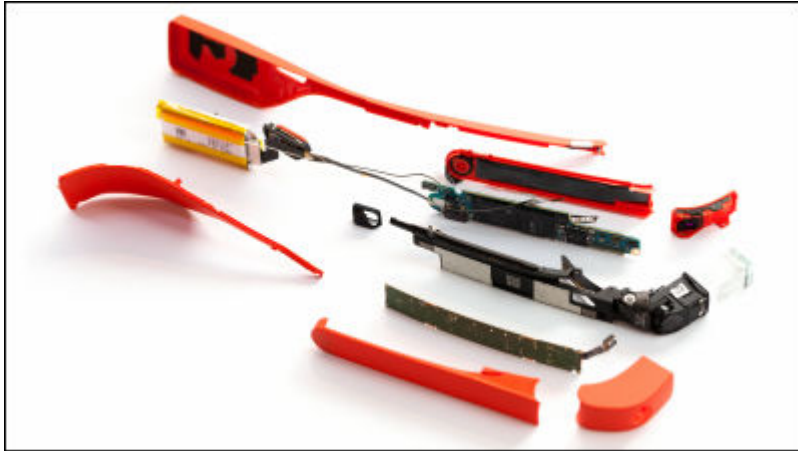
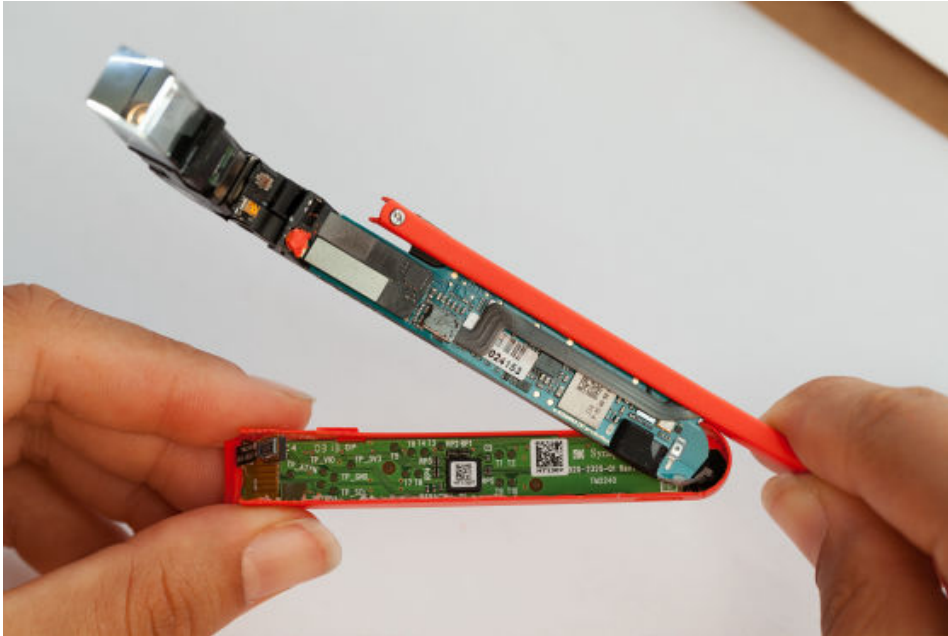


Photo taken by Google Glass



Google glass (2)



Processor: TI OMAP 4430

Storage: 16GB Flash

Battery: 570mAh

Bone Conduction Speaker

Motion Sensor: [MPU-9150](#)

WiFi connection to smart phone



Transparent view by smart phone

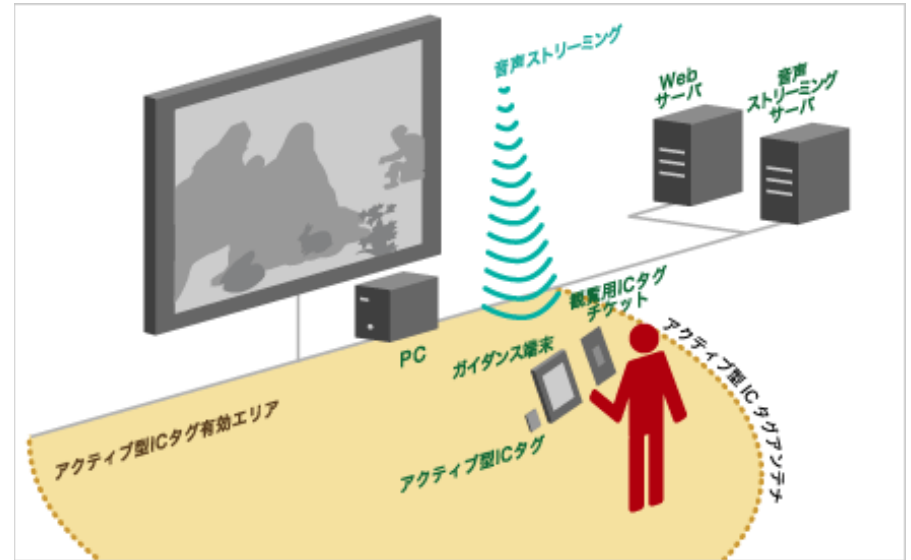
- Presented at CEATEC2008 by KDDI Labs
- A view beyond the obstacle (house, wall) is provided based on the location, angle information plus data base





LOUVRE - DNP MUSEUM LAB

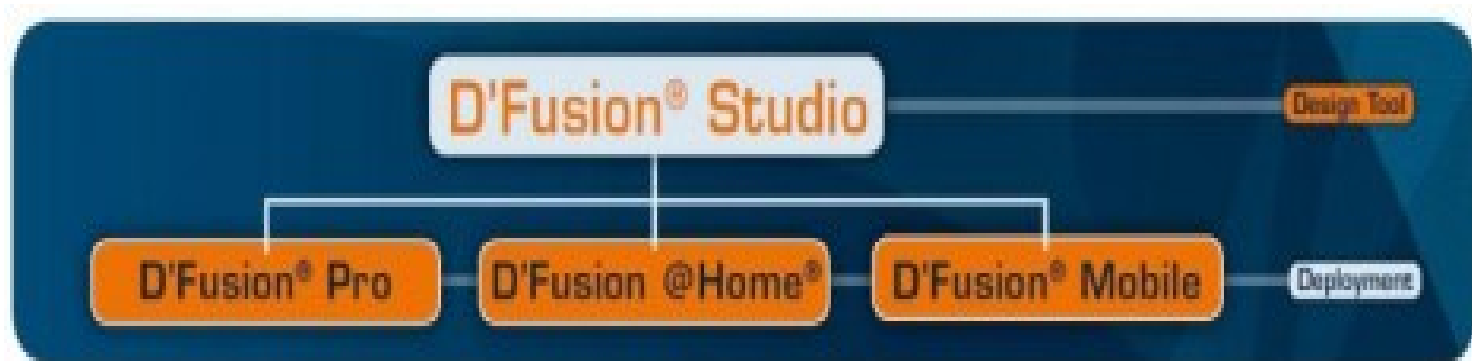
- At the entrance user pay some money and activate guide software
- In front of the object, explanation is provided to user device
- Currently, user devices are iPhone, Nintendo-3DS
- DNP is Dai-Nippon –Printing, a Japanese company





Total Immersion (France)

- Object tracking and presentation platform for AR



ビデオあり

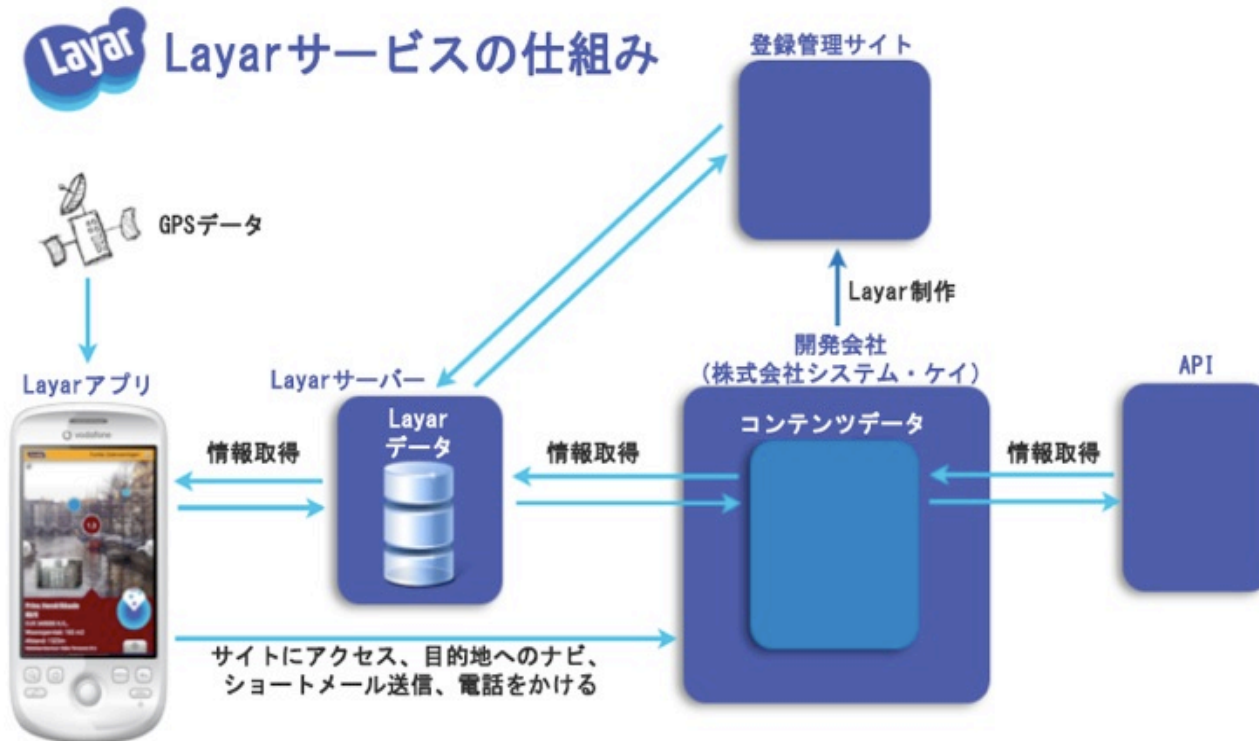
Total Immersion

Tesco Virtual Store



Layar Vision by Layar

- Layar provide AR platform globally



<https://www.layar.com/augmented-reality/>



AR business situation

- When people watch demos, everybody show interest
- Actual market is, however , quite slow because most of the “reality” do not have information tag
- Increasing objects which have information tag is the key to AR business
- Standardization of information Tag format is very important



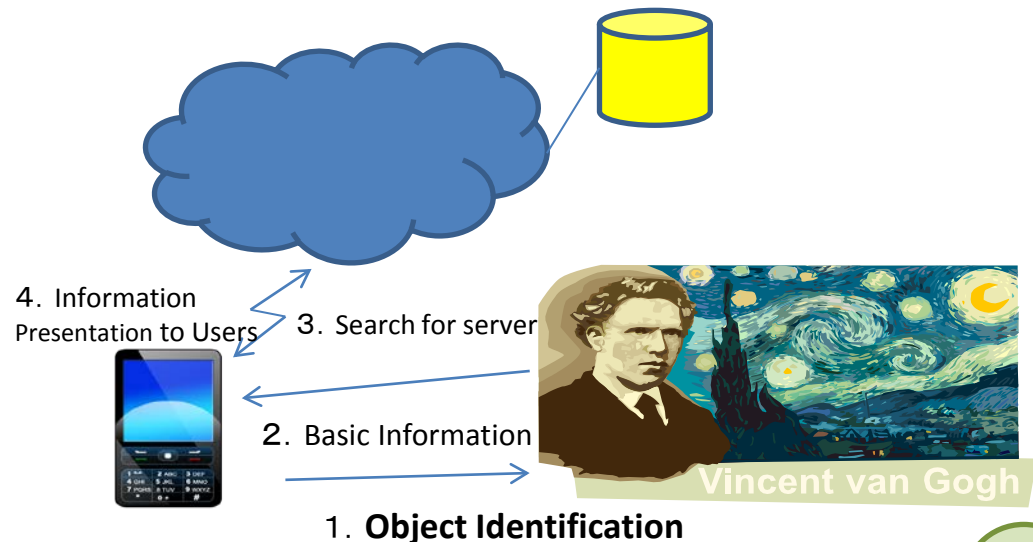
Consideration on AR business
What standardization is necessary ?



Object identification

Which object user want to know about ?

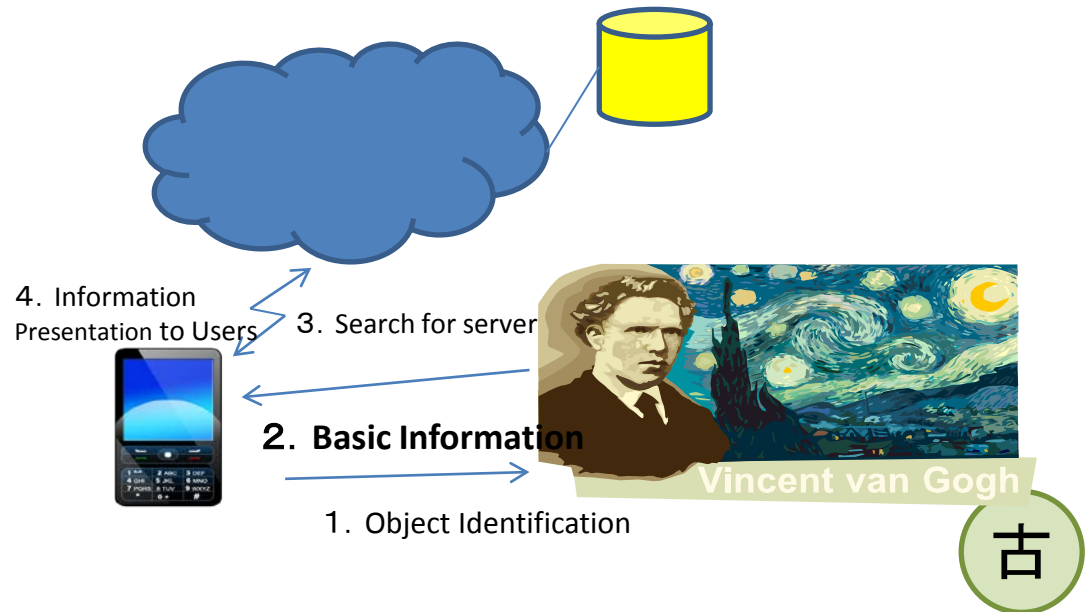
1. Camera and touch on the display
2. Camera and user eye contact detection
3. Objects transmit information, menu selection if there are many objects
Bluetooth, WiFi
4. NFC touch (like Suica)





Obtaining basic information on Object

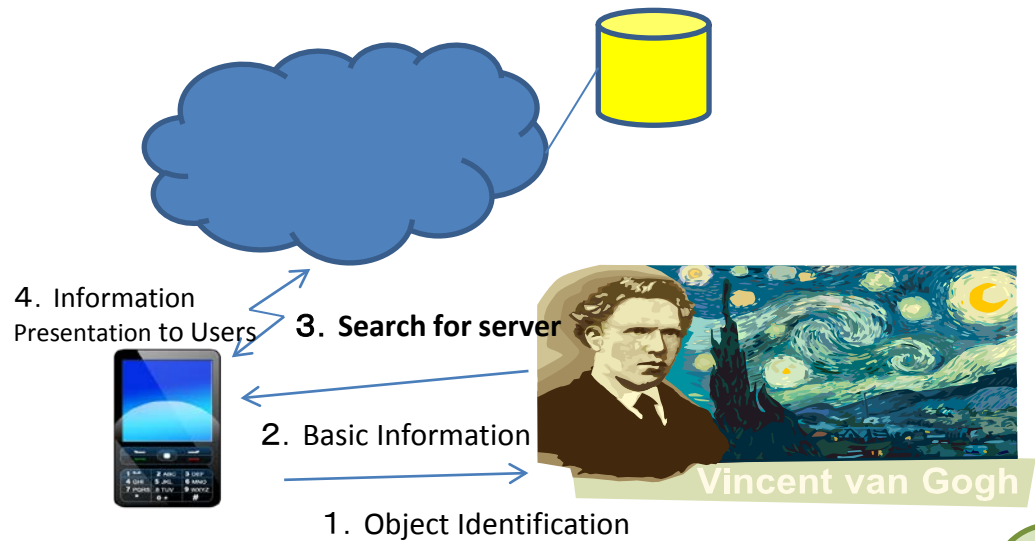
1. Pattern recognition from picture + (Location information)
2. Objects provide information
Bluetooth, WiFi, NFC, barcode





Access to the network

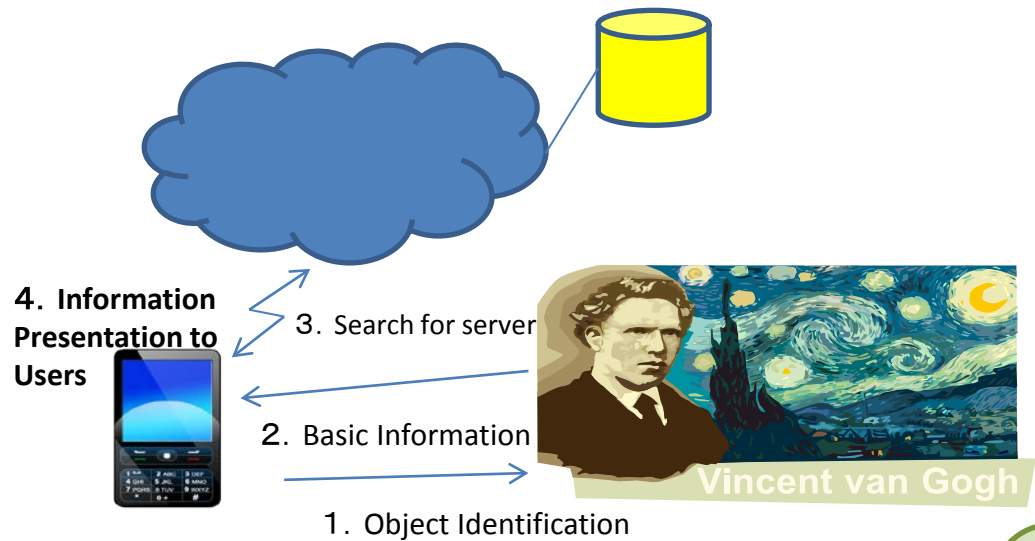
If more detailed information is necessary, access to the network
Object must be able to identify for data base search
Bread: which bread in which shop, which shelf





Information presentation to users

Text, video, graphics ,voice
Superimpose to pictures





What standardization is necessary
for AR market expansion ?





Key to success of AR is standardization

- Information about objects is the essential thing for AR
- Objects belong to many different people
 - In many cases, they are not IT experts
- **Defining standard format** is very important to make information tag easy
- Standard is also important to reduce system cost



Museum is a good industry to start

- Museums have many valuable items, which people want to know more about
- Actually some museum have started AR services
 - Headphone service to explain objects is quite common
- Museums are independent, and people in museum are not IT experts
- A good coordinator is necessary to make a standard information format and tools
 - There is a business chance for a coordinator
 - ビデオ: Mobile Money



Who are good candidates to
coordinator ?

Standardization body to handle AR
data format is unclear.

