

# **From Sensors to Business Models**

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July 15, 2013

# Health Technology (R)evolution

## Target: Hospital@Home

### Diagnostics

CAT  
Scan+ Art → Biomarker  
Tests + AI

### Treatments

Surgery → Localized  
Therapy

### Maintenance

Screening → Continuous  
Care Δ

### Mode

Generalized  
/ Episodic → Personalized  
/ Continuous

### Social

Professional  
Staff → Friends and  
Family

### Zeitgeist

MD as God → MD-Patient  
Collaboration



# Steps on The Path

1

## Sensors

- Single function
- Fitness based
- Multi function
- Medical devices
- Sharp cost reductions

2

## Integration

- At care levels
- At individual
- Information
- Communication
- Back-end

3

## Business Model

- Info ownership
- Patient control
- Transparency
- Disintermediation
- Low / high cost resource balance
- ?Industrial level transformation?



# An Explosion of Measurement and Sensing

- **Initially primarily for fitness and security**
  - Lots of apps to encourage fitness
- **Increasingly for body measurements**
- **Increasing, but small scale elderly options**
- **Clinician oriented solutions**
- **small market**
  - mixed results
- **smaller market**
- **may be gaining traction**
- **emerging mobile/remote biometrics**



# Single Sensors



# Multi-sensors or Single Function

**visi**  
MOBILE



**numera** | Libris™



**SCANADU**



**amiigo**



# Information Transparency / Exchange



**Employer-based plans  
benefits and pharmaceutical costs**

*Finding Care Specialists....*



*Patient owned and shared  
information*



*Organizations Promoting Change*



*Interoperability initiatives*



**Social Media Health Network**

*Adopting Social Media in Health Care*



# Today's Barriers

- **Fear of the data base marketing**
- **Too many extra things to do**
- **Addresses only one, or a small portion, of needs**
- **Cool innovative idea without market merit**
- **Not elderly-centric**
- **Cost too much or no reimbursement**
- **Government uncertainty**
- **Was Google's exit a prediction?**
  - but Apple is hiring...





## **Step 2. Integration**



# A Case for Integrated Home Care

**MEDICAL  
CENTER VIEW**

Nominal Hospital Healthcare	Discharge	Current Nominal Home Healthcare	Current Home Examples
High tech environment	Loss of managed care	Some tech	Smartphone, WiFi, PC, iPad - "WebMD" (at best)
High touch environment	Loss of real-time information	Intermittent and Care Giver dependent	Family, Contractor
Checked and re-checked actions	Loss of patient touch points	Opportunistic	Intermittent care plan adherence
Massive, real-time information	Reduced ability to practice medicine between episodes	Qualitative "information"	Low tech consumer medtech
Localized data		Geographically dispersed data	At home meds, Pharmacy(ies), Physician(s) Physical therapists, etc
Clear, ordered decision management		Anxiety based	?call 911, Physician, Caregiver, Hospital, Nurse?
Controlled, bounded environment		Informal and changeable environment	Mix of rooms, Out-of-home, Provider offices, car



# A Case for Integrated Home Care

**PATIENT VIEW**

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Insurers  
Medicare  
Medicaid  
Family

Primary Care      Specialist Care      RN Care


Physical Therapists      Home Aides

Pharmacies

Professional, but often with independent, uncoordinated “functional focus” with resulting disjointed and possibly conflicting care

Emotional  
Nutritional  
Cognitive  
Fitness

Inter-related elements of integral health and disease care that are rarely included or supported



Family Care Givers      Community Care Givers

Alternative Health      Spiritual Care Givers

The core of current informal home care – provided by interested and committed members but often operating without helpful knowledge

# Integration Activity



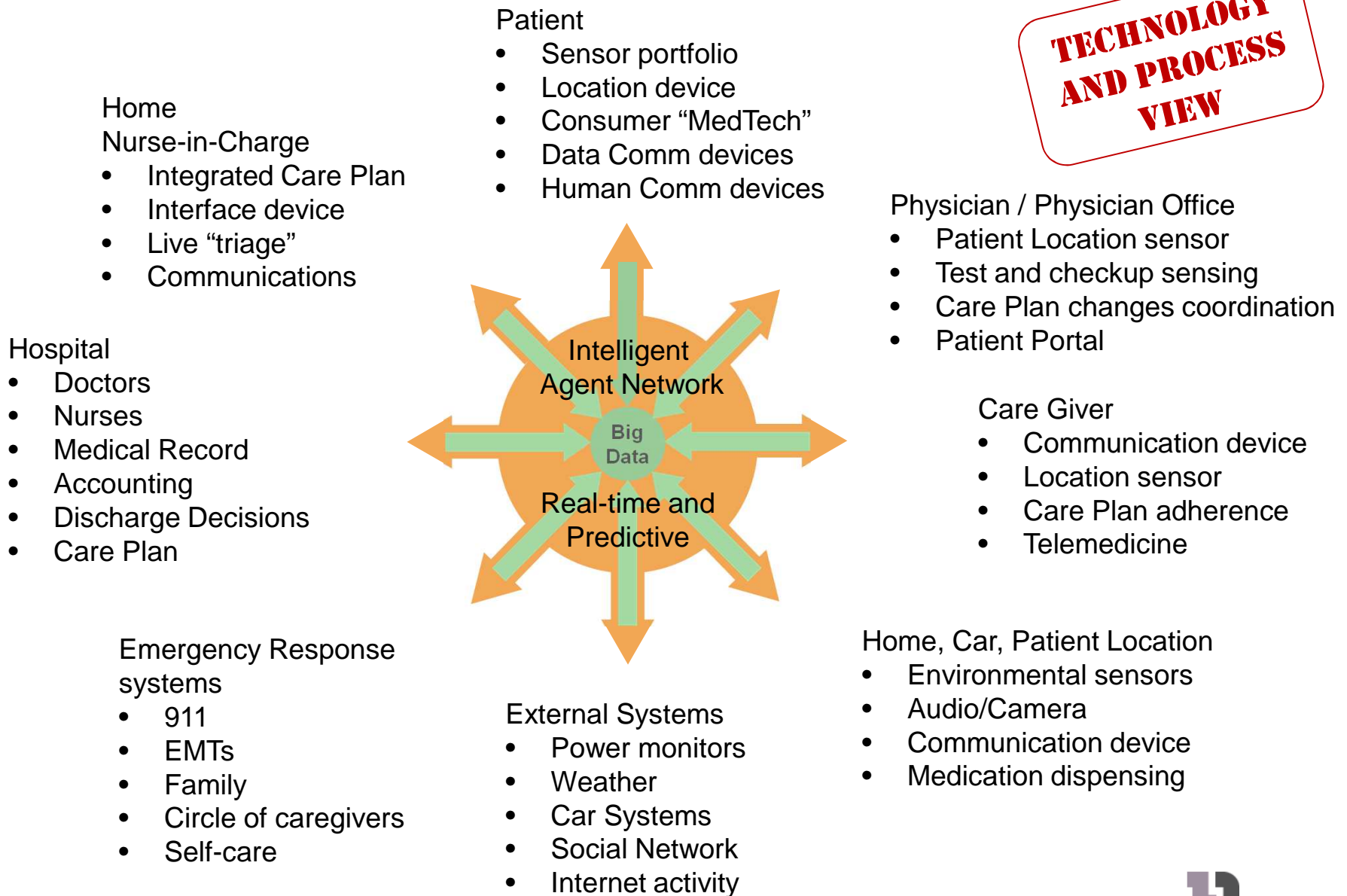
# **Big picture integration – Integration at the person**

- **Genome sequencing**
- **Personalized medicine**
- **Health record ownership**
- **Managing your care providers**
- **Cost transparency**
- **Managing your insurer**
- **Personal monitoring**
- **Social disease management**
- **Global analytics (your personalized NSA or Google)**



# A View of Integrated Home Care

## TECHNOLOGY AND PROCESS VIEW



## **Step 3. Business Models**

