Pharma and the Mobility Journey

Cognizant's Point of View

PRISME Forum – SIG Meeting
October 24-25, 2012

Dr. Elby M. Nash
Principal, Cognizant Business Consulting

Suresh Ganesan, AVP
Technology, Life Sciences & Healthcare

Agenda

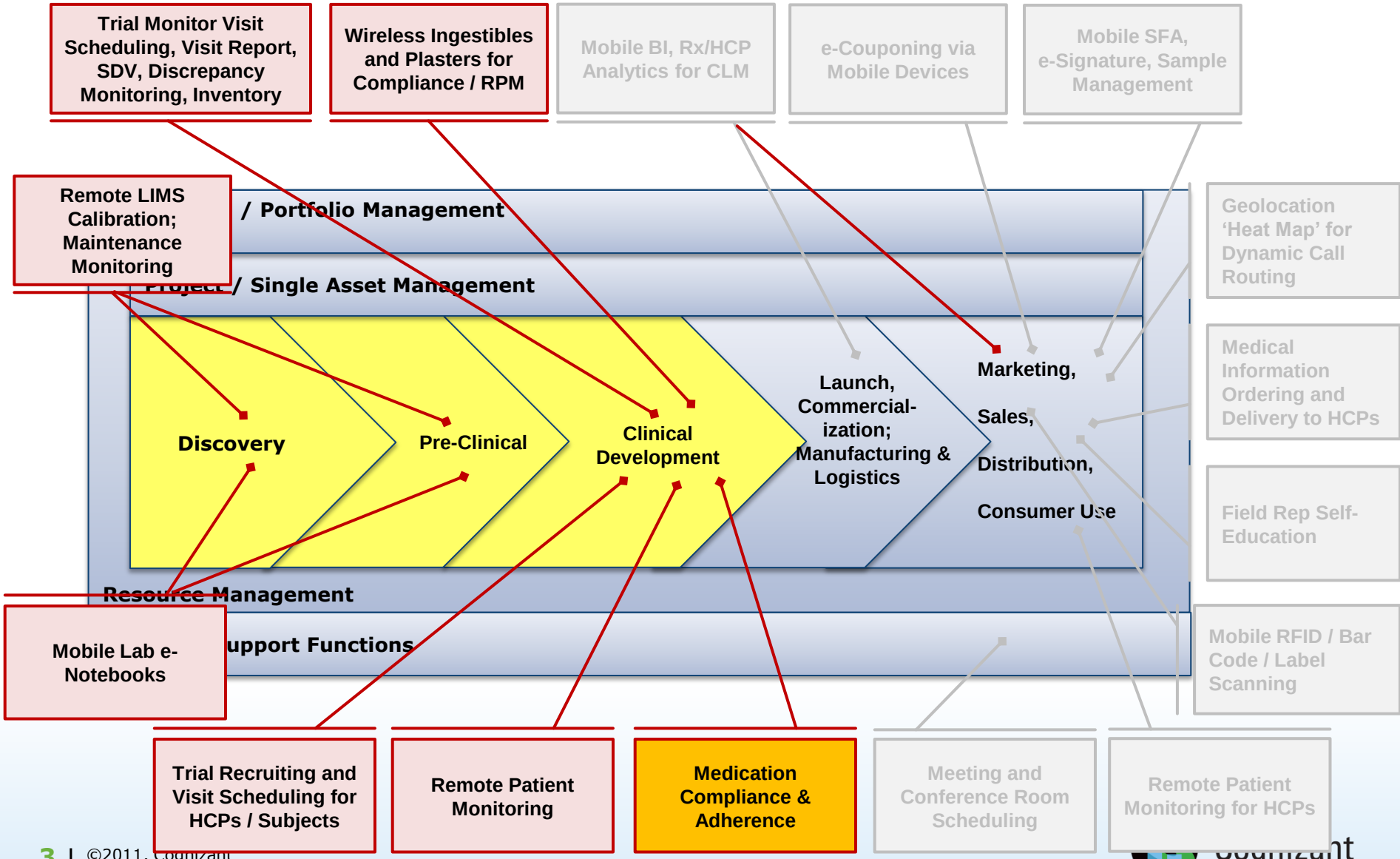
- Mobility Trends in Pharmaceuticals
- Pharma and the 'Mobility Journey'
- Next Generation Wireless and Mobile Technology
- Mobile Technology and R&D
- Social Media, Big Data and R&D
- Context-Aware Multi-modal Computing Tools
- DEMO

Cognizant

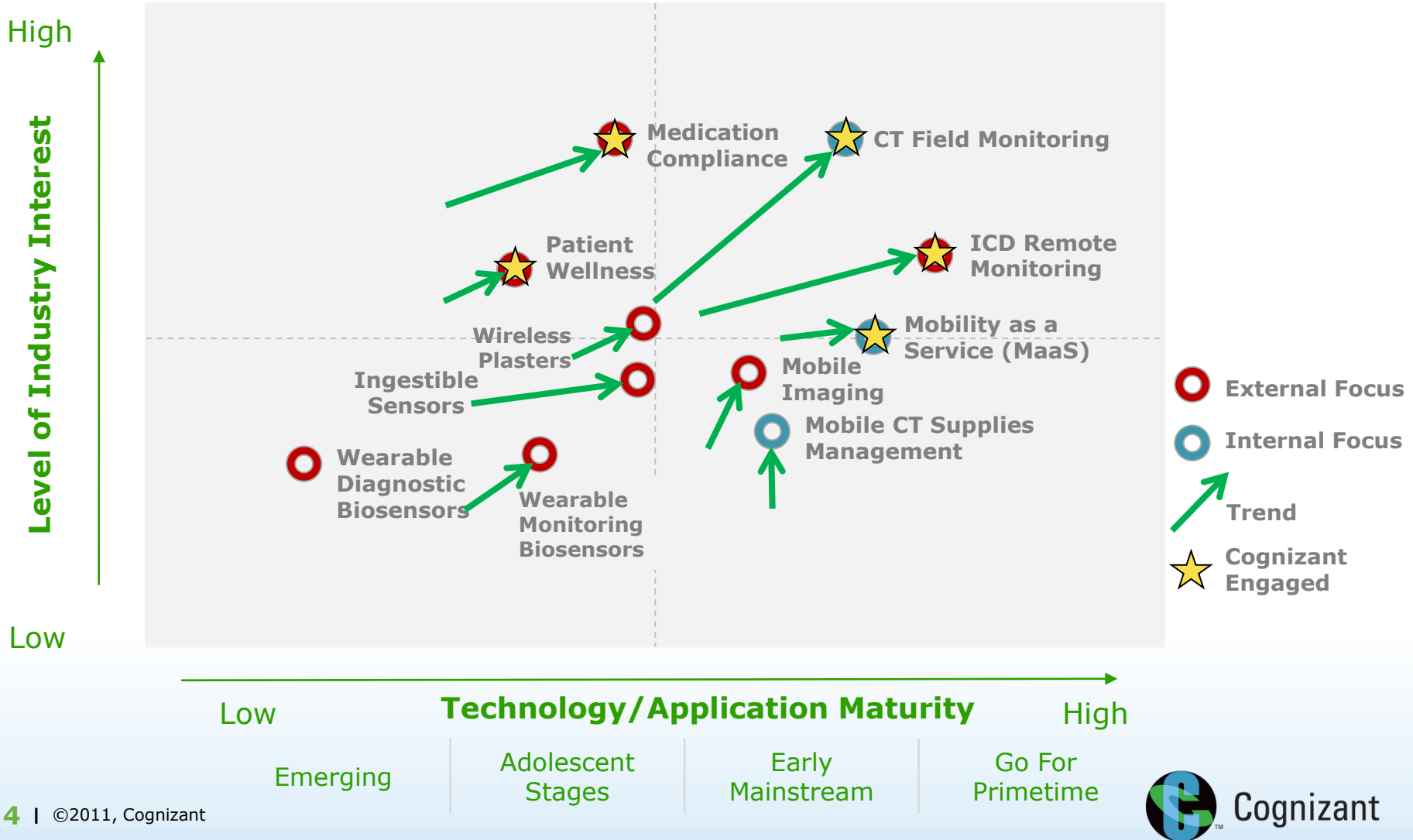
Mobility Trends in Pharma

Cognizant

Mobility Across the LS Value Chain

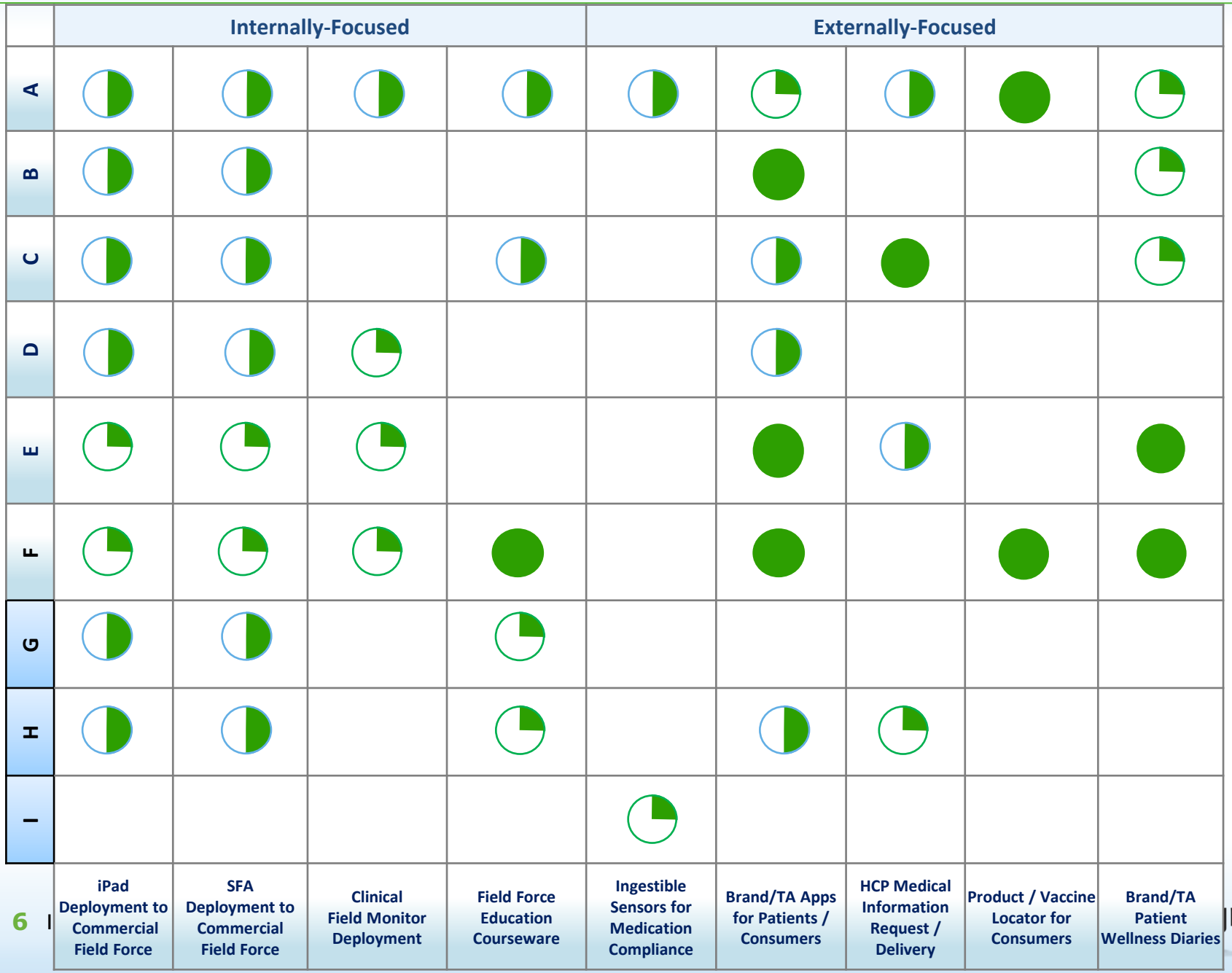


What Are We Observing?



Pharma and the "Mobility Journey"

Where Are Pharma Firms on Their Mobility Journey?



Next Generation Wireless & Mobile Technology

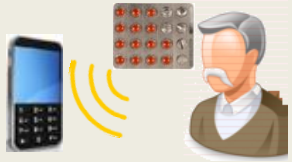
Cognizant

Wireless Healthcare – What If?

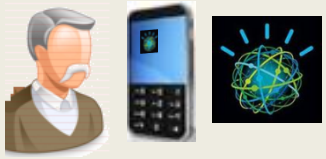
Jim is a 70 year old hypertensive COPD patient and diabetic who has been periodically hospitalized for asthma exacerbations

Daily, Jim's checks his vitals using his Bluetooth glucometer, spirometer and BP cuff and applies a skin patch on his arm to track his intra-day pulse, BG & BP

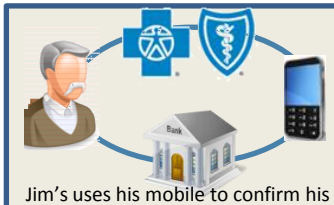
Jim's readings are sent to his mobile which forwards them to his EHR repository for recording. His intra-day pulse/BP/BG data are also recorded by his skin patch



During the day Jim receives reminders to take his medications. His BLE-enabled blister pack confirms he has accessed a pill. The digestible sensor confirms he took it



Later that day, Jim feels ill. He uses his "Watson App" and describes his symptoms. Watson tells Jim he is at risk for a bad asthma attack and to call his HCP and notifies his spouse



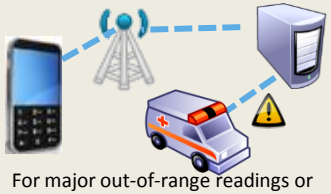
Jim's uses his mobile to confirm his insurance eligibility for a Telehealth consult. Jim authorizes his bank to pay for a consult via a mobile banking app

Jim's HCP reviews Jim's condition over Jim's mobile, accesses his EHR and reviews his current intra-day sensor readings and the Watson diagnosis

Jim's HCP notes that Jim has not used his Bluetooth Breezhaler™ recently and asks Jim to use his Bluetooth rescue inhaler which confirms use via Jim's mobile

Jim's HCP schedules Jim for a check-up as his intra-day ECG / BP / BG readings from his skin patch and his blood glucose readings show need for corrective action

Going forward, repeated non compliance with medication reminders or out-of-range readings trigger alerts to Jim's HCP and family members



For major out-of-range readings or if Jim's sensors detects a fall the smartphone triggers an alert to nearest ambulance, the HCP, a hospital and caregiver

Jim receives regular automated preventive health tips and educational material on his mobile for better self management of his health. Jim's premiums stay level.

This scenario is possible only if we have interoperability and interconnectivity standards that embrace a wide range of personal (CE) and medical wireless devices

A Glimpse into the Future

- **Medical devices will incorporate wireless connectivity as a 'native' capability to enable pairing with mobile devices**
  - Examples: ICDs, Insulin Pumps, Spirometers, Glucometers
- **Device interconnectivity and interoperability certification using a standard such as Continua will become the norm for 'mobile medical'**
- **Pharma will continue to push into the medical device space to better drive medication compliance and adherence and to reintermediate with patients**
  - Injectibles, inhalables, 'chips on a pill'
- **MBANs (Medical Body Area Networks) will enable wireless sensor patient health monitoring in clinical settings, and then in medical home settings**
- **Real-time data (and information) gathered through 'smart' and mobile devices will become important – if not primary - drivers of future profitability**

Cognizant

"Big Pharma" and Patient-Centric Medicine – Reintermediating With the Patient Via Wireless Devices

A "Big 10" global pharma firm has invested $24MM in Proteus Biomedical to license their "**chip on a pill**" ingestible sensors for organ transplantation and is evaluating Proteus' technology as part of its **organ transplant drug development** and treatment systems.

Another global pharma firm is also evaluating this technology for its **CNS franchise**.

Sanofi launched its iPhone /iPod Touch-based iBGStar plug-in glucometer for the iPhone in September 2010.

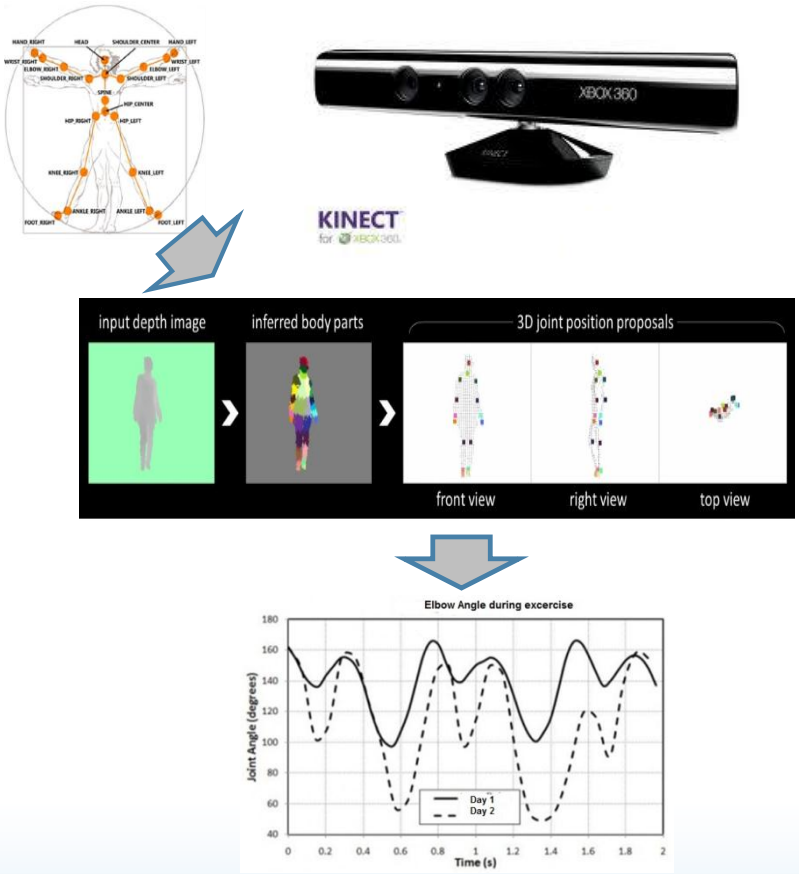
It's coupled with the new iBGStar Diabetes Manager program, a free logging app that users can download from the Apple AppStore.

Part of the growing interest in using mobile technology to improve medication compliance and improving outcomes.

Cognizant

Growing Overlap Between CE and Wireless Medical Devices

Microsoft is aggressively marketing its commercial gaming technology as a diagnostic aid….and can interface it to their HealthVault™ EHR technology



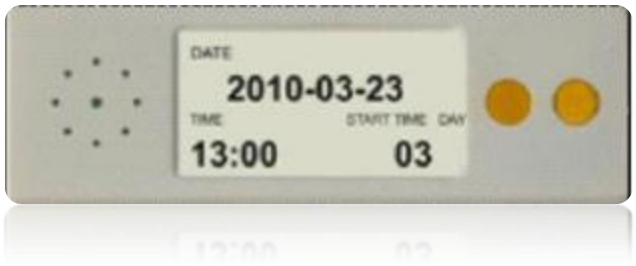
A "Big 10" Global pharma CNS franchise is experimenting with the **Microsoft Kinect** motion sensing technology developed for the **Xbox** home gaming system to assess the performance of Phase IV clinical trial **patients with CNS diseases**.

Patients use the Kinect for **at-home therapy** as well as in clinical settings.

Enables doctors – **and pharma firm** - to assess patient progress in gait, ease of motion and disease progression.

Cognizant

Wearable Wireless Sensors



- **Gentag** specializes in developing low-cost disposable RFID sensors for mobile medical applications. Their 32-cell blister pack sends an RFID signal to a mobile device to indicate when medication has been accessed by a patient.

- Additionally, Gentag has wearable skin sensors that can detect hydration levels, UV exposure, blood glucose levels, heart rate and respiration.

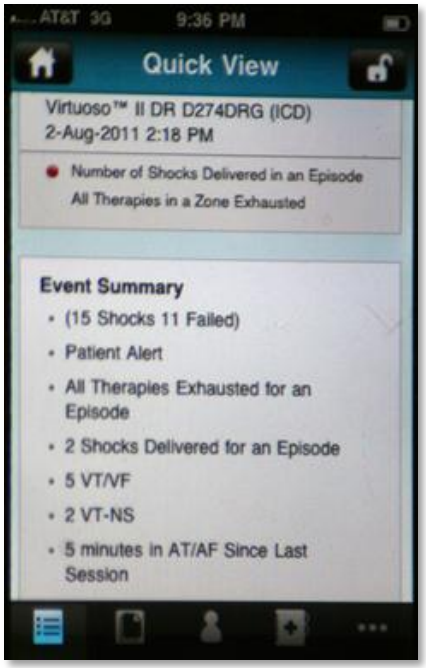
Cognizant

Remote Patient Monitoring (Telehealth)

Medical device firms are implementing mobile solutions that touch the patient and provider

- A leading medical device firm recently mobile-enabled a remote patient management system to connect cardiac patients with their doctors
- Previously, clinicians who received an SMS text notification on a critical patient needed to find a computer and access the website for details and subsequent action
- The new mobile-enabled system allows for real-time patient-to-clinic contact that greatly improves clinical efficiency and reduces time to care

Patient Alert Screen



Atrial and Ventricular ECG Readings During Event

A physician using this system describes his experience in his blog entry titled "How my iPhone Prevented an ER visit"…

Cognizant

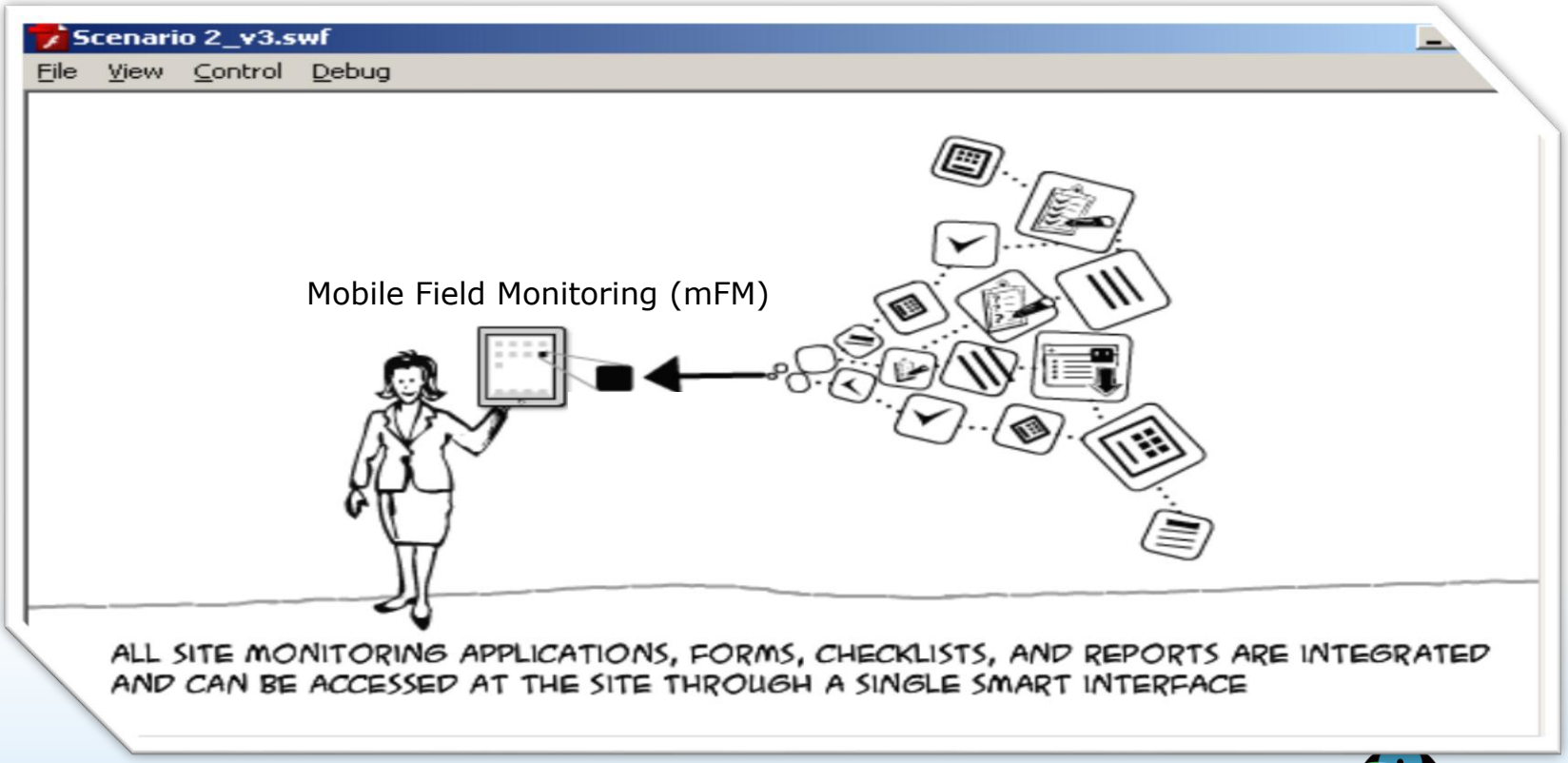
Mobility and R&D

Cognizant

Mobile Technology is Transforming Trial Monitoring

Example of Mobility in Clinical: Today Monitors spend a good portion of their time traveling for site visits, lugging laptops and looking for internet connections so they can log into systems to access site data

Future: We want to show you how tomorrow might look …



Cognizant

Imagine a future . . ….

When a Monitor can use their mobile device to view and schedule appointments with sites

Cognizant

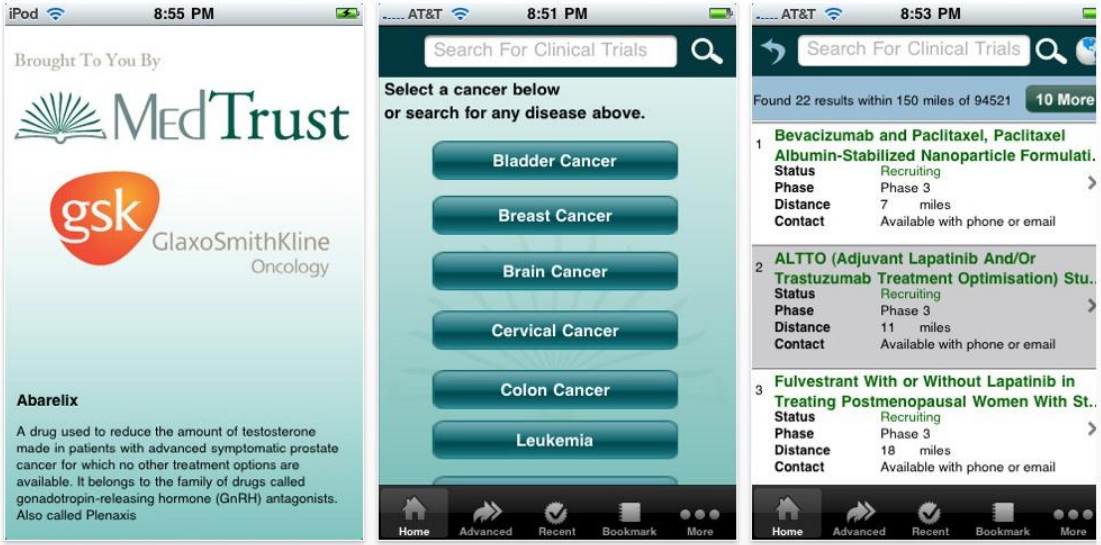
Imagine a future . . ….

When a Monitor can use their mobile device to view the latest "real time" risk indicators and data on site performance while at the site

Customizable dashboards in one mobile device to access critical trial related information…

Trial performance metrics and trends accessible anytime, anywhere…

Trial Recruiting Using Mobility and Geolocation



- US app developed by **GSK Oncology** in collaboration with **MedTrust Online** for patients and doctors to find cancer trials within 150 miles of their current location - geolocation

Cognizant

Mobile Lab Equipment Calibration

- **Syclo solutions** enable firms to calibrate and take readings from LIMS laboratory equipment using a variety of mobile devices
- **Calibration and configuration** information is stored to ensure uniform record-keeping for regulatory compliance reporting and significantly reduce 'paperwork' time and cost.

Mobile ELNs Are Now Migrating to the iPad

- **AbacaLab** offers an iPad-based ELN for technicians, scientists and clinicians that provides mobile workflow and procedure guidance through complex procedures
- **Protocol Labacus™** provides an overview of the steps in a procedure and detailed instructions for each step
- The application provides **real-time data recording and storage** ensuring that nothing gets lost or mis-transcribed

Cognizant

Social Media, Big Data and R&D

Cognizant

Big Data and Public Information

- ✓ Active Blogs on the Web: 150M+
- ✓ Social Networks: 2,900+ (61% of adult Americans have joined a social network)
- ✓ Active Facebook members:

Channels on YouTube: 40+

Can we use public information for better 'decision making' regarding drug development?

- ✓ Patients spend 91% more time on health content sites than branded Pharma sites
- ✓ 62% of survey respondents reported that information found on social media sites prompted them to visit their doctor about a specific disease or condition
- ✓ 57% of American adults surf net for health related information

Cognizant

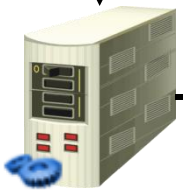
Conceptual Architecture of "iSearch"

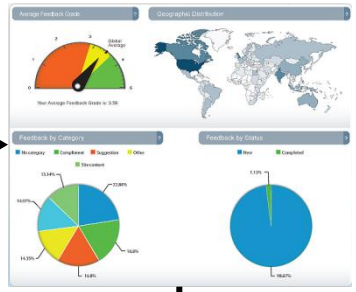
Social Media and External Data Sources

Public Non Safety Clinical Data available over internet - This data can be used for informed decision making

iSearch Business Intelligence Tool

iSearch tool to be used to search and extract relevant data from internet





The tool converts the unstructured data to meaningful and intelligent information

Key Decision Makers

Key Business Users of iSearch tool can be:

1. Executive Management
2. Clinical Trial Planner
3. Statisticians

The information can be shared with Key Decision Makers / Business Users to make informed decision

Cognizant

Business Case 1 – Investigator Performance Analysis

Business Case

Generate a list of partnering investigators with negative feedback and thus help in creating a clean master investigator database

Data Processing Steps

1. **Analyze governmental websites (FDA and AHRQ) using iSearch to find warning issued to investigators**
2. **Compare the list with Master Investigator Data Base to find if the company is engaged with any such investigator**
3. **Generate a consolidated list of partnering investigators with negative feedback**

Business Case 2 – Predictive Investigator Recruitment

Business Case

Predictive Analytics for facilitating Investigator Recruitment

Data Processing Steps

1. **Pulling of data from External Investigator Database and Internal Database**
2. **Compare Investigators by Therapeutic Area and Location to determine the additional investigators who can be recruited**
3. **Generate detailed contact list for the additional investigators and update the Master Investigator Database**

Cognizant

Business Case 3 – Clinical Trial Disclosure Analysis

Business Case

Mining and Analysis of publicly available Clinical Trial Disclosure information to gain competitive advantage

Data Processing Steps

1. **Extraction of unstructured data from Clinical Trial Registry sources like ClinicalTrials.gov**
2. **Massaging of unstructured data to mine the key data points from the data dump**
3. **Creation of reports to determine what investigational drugs the competing Pharmaceutical companies are working on**

Cognizant

Food for Thought – Taking a cue from the Banking Industry

- Banking Industry has successfully employed similar solutions with significant benefits:
  - ✓ BVA Bancomer decreased fraud losses by 30%
  - ✓ Commonwealth Bank of Australia detected 2X more check frauds

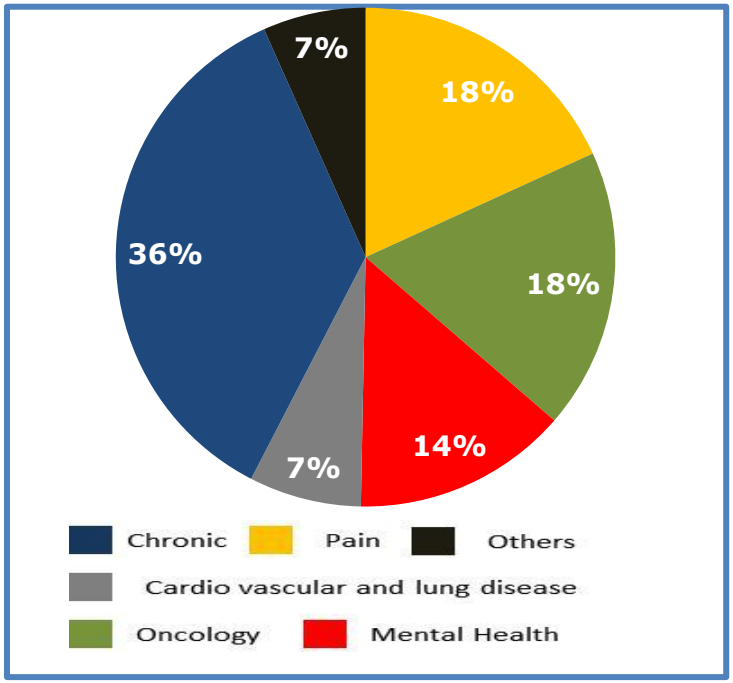
✓ Highmark BCBS processed 30% more fraud cases - $12MM first year savings

Data Source: SAS Institute

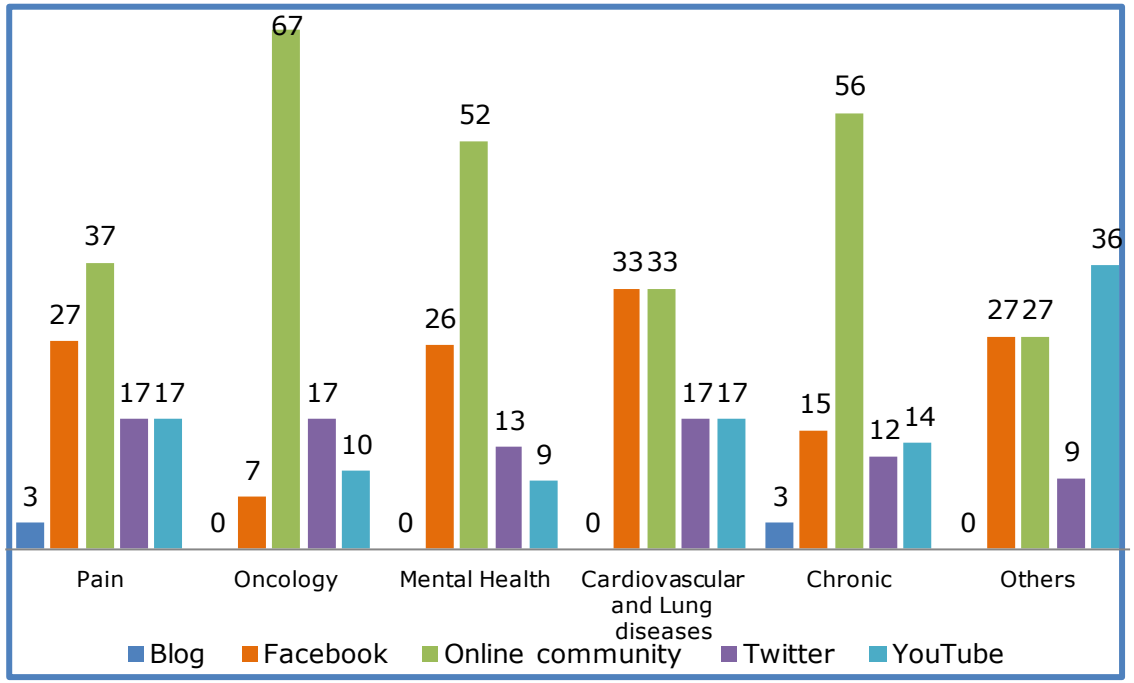
Cognizant

What Therapeutic Areas are Receiving the Most SM Focus?

Percentage breakup of disease areas presence in Social media universe



Percentage breakup of disease areas presence by Social media channels



Based on research by Cognizant Life Sciences Business Consulting

- Pain, Oncology and Chronic Disease are the best represented disease areas on social media programs
- Online Community is the preferred channel for disease related discussions especially for Oncology and Chronic disease areas
- Blogs have minimal presence for disease related discussions
- 20% of the total online discussions mention health as their primary objective of discussion with depression being the key therapeutic area and 60% of the connected people using internet as their first source of information about health related matters

Cognizant

Context-Aware Multi-Modal Computing Tools

What is eMLE?

- Enterprise Multimodal Learning Environment (eMLE) is a virtual assistant that provides convenient access to Enterprise Information Portal (EIP- Intra & Extra) and content sources and social sites (internal & external) from a variety of mobile tablets & phones
- eMLE makes information:
  - Reachable {alerts}
  - Searchable {convenience}
  - Accessible {choice of devices/online/offline modes}
  - Consumable {context-aware rendering}
  - Sharable {social-networking, blogs}
  - & interesting {personalize}

  through convenient & appropriate interaction on-the-move
- eMLE allows users to save content for offline viewing as appropriate with ability to securely manage offline data and remotely lock & wipe to prevent compromise of enterprise information
- eMLE also optionally provides options to create and contribute multi-media content from mobile devices in the field

Cognizant

Questions?

Cognizant

Thank You

Cognizant