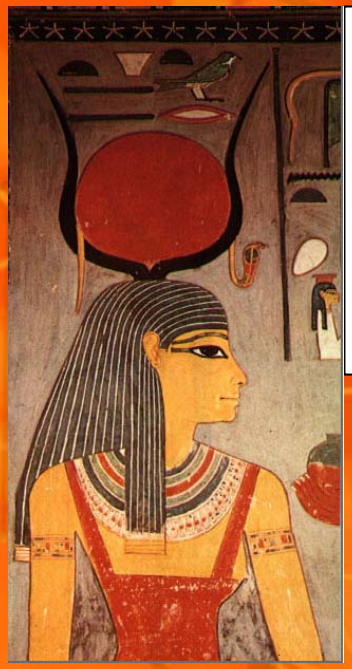
First Annual

Triple Helix Summit

February 12 – 13, 2007

University of Hawaii • East West Center • Hawaii Imin International Conference Center • Honolulu, Hawaii

Making Hospital Filmless- MDIS
A case study of Triple Helix



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Professor of Radiology
Director of ISIS Center
Associate VP for Special Programs
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ISIS Center

Col. Fred Goeringer (Ret.) - GOV
TIA Group

Fred Prior, PhD - IND
Washington University

Yongmin Kim, PhD - ACAD
University of Washington

tiag™ The Informatics Applications Group
When commitment matters

Washington University in St. Louis
School of Medicine
MIR Mallinckrodt Institute of Radiology

Triple Helix

Collaboration
Government, Industry and Academia
To Achieve Common Goods and Societal Benefits through Commercialization of Innovation

Digital Imaging Network (DIN)
Medical Diagnostic Imaging Support (MDIS)
Picture Archiving and Communication System (PACS)
Image Management and Communication System (IMACS)

Problem Definition

- Military Medical Treatment Facility
  - Large Field Hospitals
  - Huge Logistical Burden for Films and Chemical
- Diagnostic Imaging
  - Emerging Digital Imaging Systems
- Technology
  - Emerging Digital and Communication

Government-DoD Sets the Goal

Filmless Hospital

Any Images Any Where Any Time!

John Perry and Mike Sullivan

Government Convenes

- Technology Survey- MITRE Corp.
- Feasibility Study
- Establishes Test-bed
  - Academia
    - Univ. of Washington and Georgetown Univ.
  - Industry
    - Philips Medical and AT&T
- Defines Functional Requirements
  - Large Scale System Engineering
  - Comprehensive Engineering Documentation

Barriers within the Government

- Culture of “Bugs and Drugs”
- Emerging Digital Concept Challenged
- Lack of Internal Experts
- Gap: Research and Operational Community
  - No Clear Way to Bring Research Results into Operational Community

Barriers within the Industry

- No Customers and No Market
- No Products and No Technology
- Conflicts between Business Domains
  - Old Analogue and Digital Business
  - Device/Supply vs. Network Business

What is Network Business?

- Is this a medical business?
- What are we selling?
- Who should be in the business?
  - Device, Network, Bandwidth, Storage
- What is the product?
- Is this going to heart existing business?

Barriers within the Research Community

- Biased toward Disease Research
- Network and Operational Research- Low Priority
- Component Based Research
- Departmental Focus
- Lack of Appreciation on the Enterprise Issues and Systems Engineering

Government's Strategy

- Industry
  - Make it work - Engineering
  - Encourage the development of technical standards
- Academia
  - Make is useful. – Science
  - Facilitate the creation of community of interests
- Government
  - Promote Cultural Change- Real Time Radiology
  - Establish technology insertion point(s).

Developments within the Government

- Visionary Leadership – Gen Russell
- Experts and Champions
  - Don Smith, MD and Mike Cawthon, MD
- Emerging Concept Validated
  - Desert Storm and Bosnia
  - Deployable Radiology (DEP-RAD)
- Technology Insertion
  - Tied to Hospital Construction Project
  - Tied to Core Mission: Combat Support

Deployable Radiology
DEP-RAD
Teleradiology
CT and CR
Two Years

Combat Support Hospital
Bosnia
Combat Support Hospital
Hungary
Lanstuhle Hospital
Germany

Macedonia: *Quick Review of Medical Situation*

Development within the Industry

- Small Start-ups Become Viable Businesses
- Digital Revolution
  - Series of digital products
- Internet Revolution
  - Images can be moved and viewed!!
  - Changes in mind set –Digital is here to stay

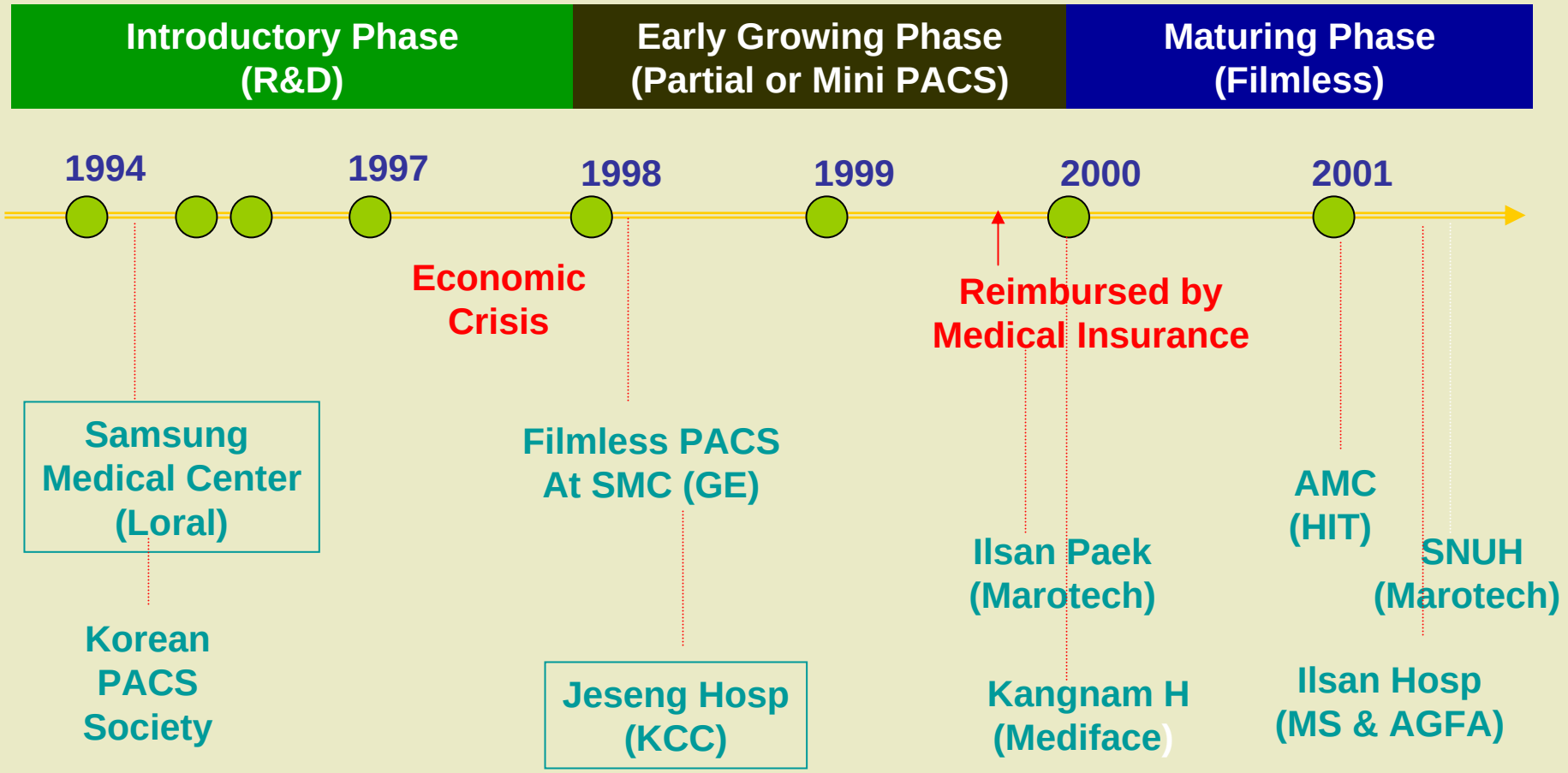
Development within the Research Community

- Leading Academic Centers Show Interests
- Industry Responds
  - Sponsored Research
- System Level Research Begins
  - Work flow Research – AT&T Introduction

Samsung Medical Center
Seoul, Korea

- PACS tied to construction of a flagship hospital in Seoul, Korea
- Strategic Investment by New Multinational Conglomerate
- Strategic Collaboration with DoD

History of Filmless Hospitals in Korea



Other Developments

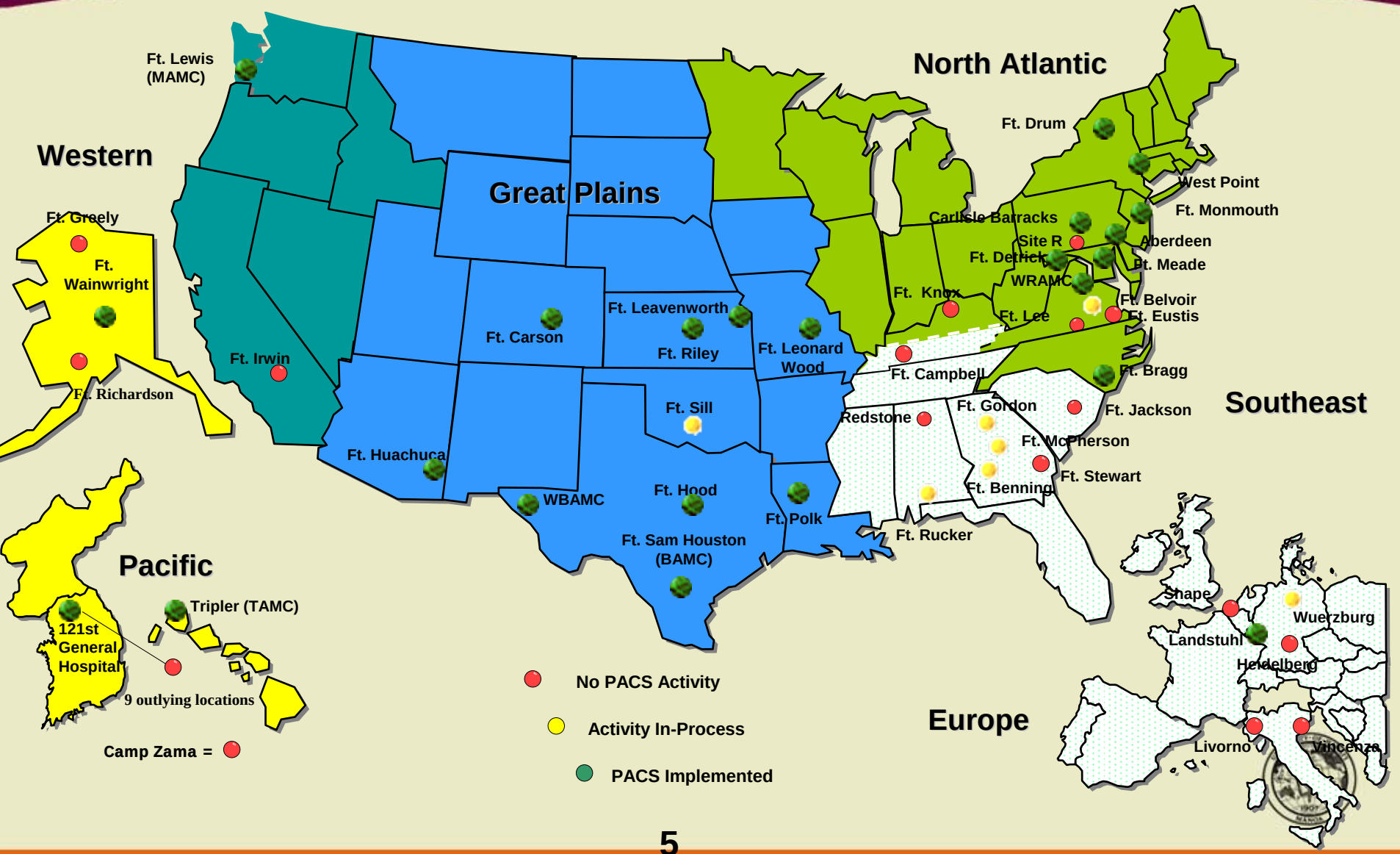
- VA Medical Center in Baltimore
- Hammersmith Hospital In London
- Demonstrations Projects
  - Vienna, Austria
  - Germany
  - Holland
  - Hokkaido, Japan
  - Others

New Madigan Army Medical Center with Full PACS (1992)

PACS Today

- Filmless Hospitals – Standard and Essential Technology
- Radiology Department cannot operate without PACS- Productivity Essential
- PACS Market Size: App. $5-7 Billion
- PACS has been a boom market for the Industry: more than 50% of RSNA exhibits are PACS-related
- Traditional Imaging Companies Dominate

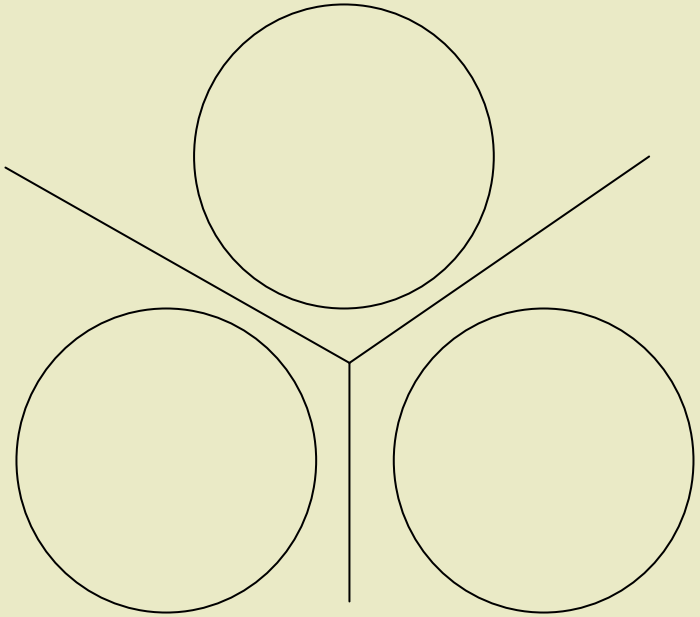
Global DoD PACS Work Load Redistribution



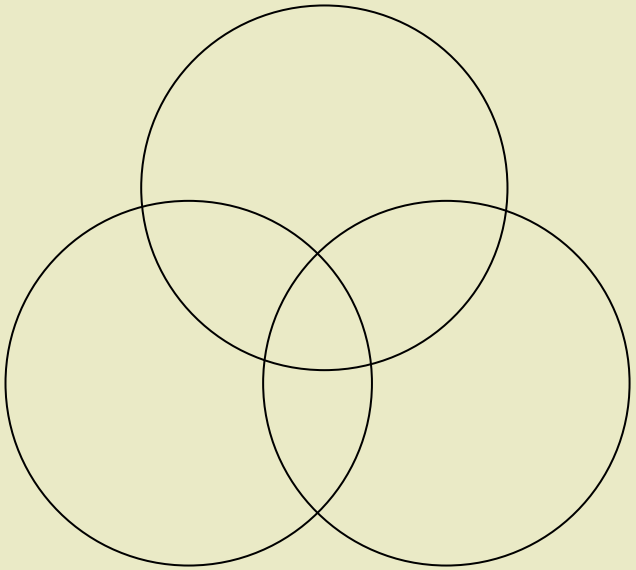
Success Factors

- Community of Interests with Shared Vision
- Meeting Place For Open Dialogue-SPIE
- Timed with Explosion of Digital Revolution, e.g., networking, PC, display, storage.
- Government (DoD) leadership and risk-taking
- Dedicated Selfless Individuals with Mutual Respect and Trust – Open Dialogue
- Role of IP: Minimum

Models



Status Quo
Minimum Risk
Comfortable



Vision and Courage
Risky
Uncomfortable

Can this be replicated?

- It Depends
  - Technology
  - Individuals
  - Opportunity
  - Environment