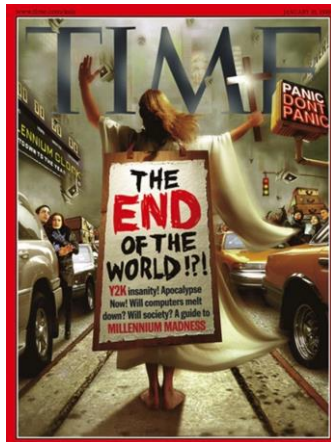
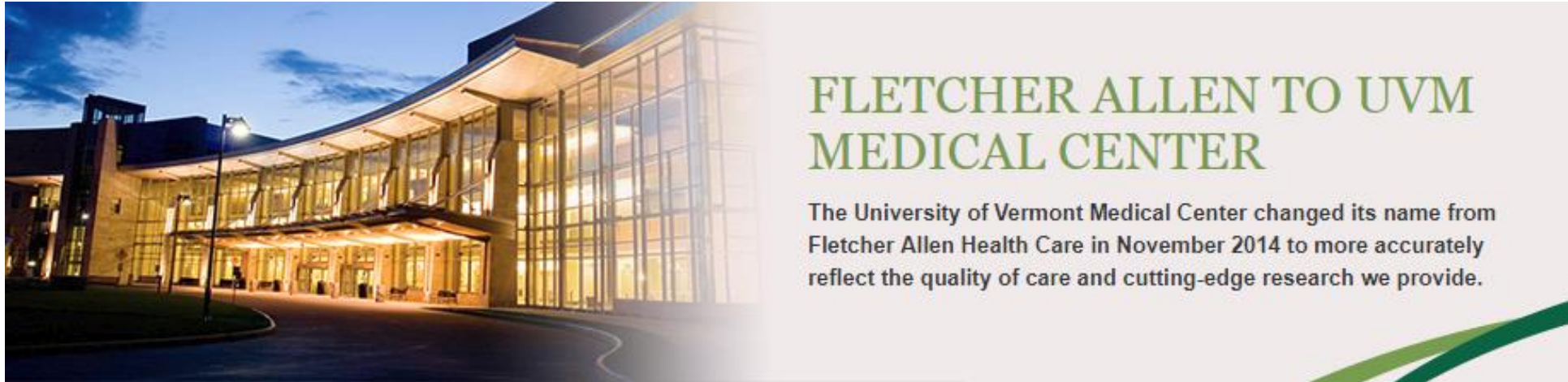


MIS5206
Protecting Information Assets
– Unit #3b –

**Case Study #3 – A Hospital Catches the
“Millennium Bug”**

A Hospital Catches the “Millennium Bug”



Case Team Exercise

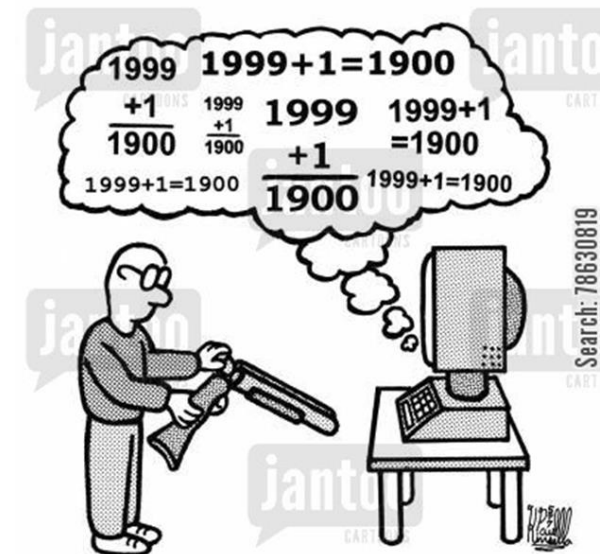
1. Describe the IT threat caused by the Year 2000 bug
2. From an information security perspective, how would you characterize the millennium (“Y2k”) bug and assess the risk from it that Fletcher-Allen Health Care faced in May 1998 ?
3. How would you assess the hospital’s readiness to control the risk ?
Be sure to provide details to support your approach to the assessment
4. How is the Year 2038 problem similar to and different from the Year 2000 bug ?

1. Describe the IT threat caused by the Year 2000 bug

“Millennium” or “Y2K” Bug

A useful case study for learning about enterprise organizational IT risk management given proactive knowledge of a known pervasive threat

- Last century, software and firmware developers used two-digit year fields, instead of four-digit year fields in their code to reduce memory usage requirements
- Examples of years captured in a 2 digit data field
 - “99” used in year portion of date fields for “1999”
 - $99 + 1 = 00$ rather than $1999 + 1 = 2000$
 - “98” used in year fields for “1998” ...
 - “00” in year fields as either “1900” or zero or “2000”
- Affected software included...
 - Microsoft Excel
 - COBOL, C, JavaScript,... programming Languages
 - Unix Source Code Control System
 - ...



2. From an information security perspective, how would you characterize the millennium (“Y2k”) bug and assess the risk from it that Fletcher-Allen Health Care faced in May 1998 ?

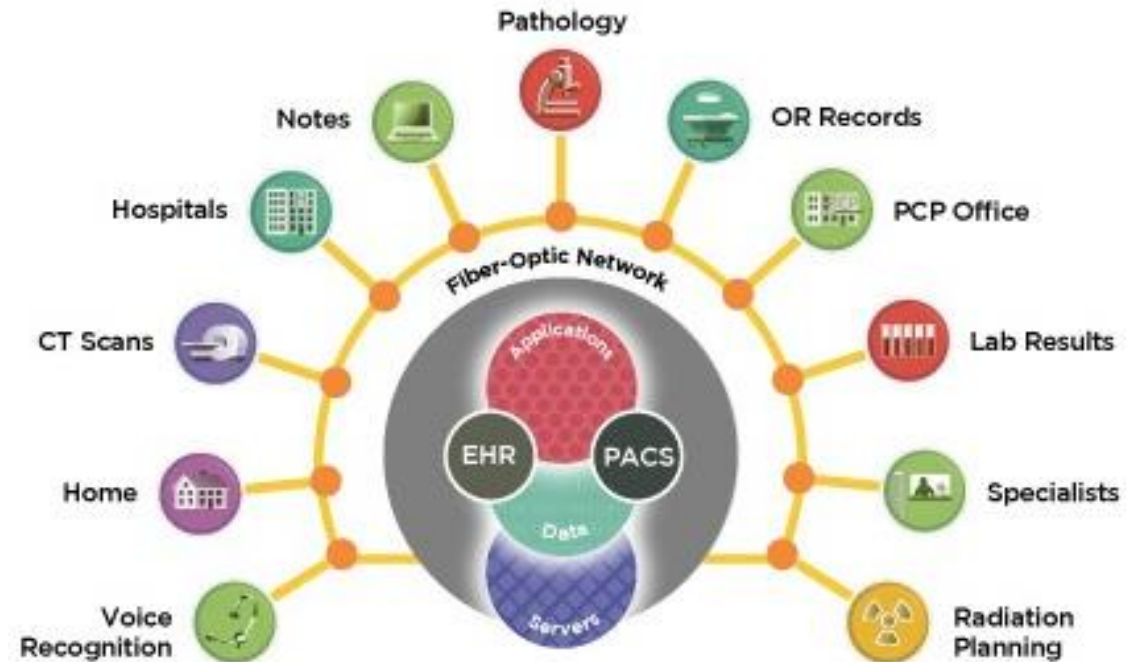
	POTENTIAL IMPACT		
Security Objective	LOW	MODERATE	HIGH
<p>Confidentiality Preserving authorized restrictions on information access and disclosure, including means for protecting personal privacy and proprietary information. [44 U.S.C., SEC. 3542]</p>	The unauthorized disclosure of information could be expected to have a limited adverse effect on organizational operations, organizational assets, or individuals.	The unauthorized disclosure of information could be expected to have a serious adverse effect on organizational operations, organizational assets, or individuals.	The unauthorized disclosure of information could be expected to have a severe or catastrophic adverse effect on organizational operations, organizational assets, or individuals.
<p>Integrity Guarding against improper information modification or destruction, and includes ensuring information non-repudiation and authenticity. [44 U.S.C., SEC. 3542]</p>	The unauthorized modification or destruction of information could be expected to have a limited adverse effect on organizational operations, organizational assets, or individuals.	The unauthorized modification or destruction of information could be expected to have a serious adverse effect on organizational operations, organizational assets, or individuals.	The unauthorized modification or destruction of information could be expected to have a severe or catastrophic adverse effect on organizational operations, organizational assets, or individuals.
<p>Availability Ensuring timely and reliable access to and use of information. [44 U.S.C., SEC. 3542]</p>	The disruption of access to or use of information or an information system could be expected to have a limited adverse effect on organizational operations, organizational assets, or individuals.	The disruption of access to or use of information or an information system could be expected to have a serious adverse effect on organizational operations, organizational assets, or individuals.	The disruption of access to or use of information or an information system could be expected to have a severe or catastrophic adverse effect on organizational operations, organizational assets, or individuals.



Fletcher-Allen Health Care

May 1998...

- Millennium bug or “Y2K problem” affected availability of administrative and clinical software and other devices and systems containing embedded microprocessors



Y2K Problem Risk Management Plan...

1. Inventory – Identify hardware & software with Y2K problem
2. Analysis – Examine code for date fields, determine which to fix
3. Remediation – Alter the code for Y2K compliance
4. Testing – Ensure that altered code produces correct results
5. Migration – Put new code into production

3. How would you assess the hospital's readiness to control the risk ?

Be sure to provide details to support your assessment

Asset Inventory

Applications Supported by Fletcher-Allen Information Services			Applications Supported by Fletcher-Allen Information Services		
System Name	Y2K OK?	Plans for Compliance	System Name	Y2K OK?	Plans for Compliance
IBM Encoder – Medical Records Encoder	?	Unknown	IBM Encoder – Medical Records Encoder M/F	?	Replace – 3M Encoder, IDX Integrated
ANSOS	?		ANSOS	?	
Applix	Y	Vendor indicates compliance	Bones	?	Retire/Obsolete
Bones	?	Retire/Obsolete	Clinical Financial Information System (CFIS)	?	Retire/Obsolete
Clinical Financial Information System (CFIS)	?	Retire/Obsolete	Clinical Data Editor	?	Retire/Obsolete
Clinical Data Editor	?	Retire/Obsolete	Cloverleaf/HCI Interface Engine	?	Vendor indicates compliance
Cloverleaf/HCI Interface Engine	?	Vendor indicates compliance	Data Repository – Oasis	?	Vendor indicates compliance
Data Repository – Oasis	?	Vendor indicates compliance	Data Warehouse – Cognos	?	Vendor indicates compliance
Data Warehouse – Cognos	?	Vendor indicates compliance	Data Warehouse – Data Extracts	?	
Data Warehouse – Data Extracts	?		Data Warehouse – Metaphor	?	Retire
Data Warehouse – Metaphor	?	Retire	Data Warehouse – Redbrick	?	Vendor indicates compliance
Data Warehouse – Redbrick	?	Vendor indicates compliance	Dictaphone -Digital Dictation, Enterprise Voice	Y	Vendor indicates compliance
Dictaphone -Digital Dictation, Enterprise Voice	Y	Vendor indicates compliance	Dictaphone – Enterprise Text	Y	Vendor indicates compliance
Dictaphone – Enterprise Text	Y	Vendor indicates compliance	ORG Grouper	?	Retire/Obsolete
ORG Grouper	?	Retire/Obsolete	First Coast - Accounts Payable	?	Retire – by the Year 2000
First Coast - Accounts Payable	?	Retire – by the Year 2000	First Coast - ADT	?	Retire – by the Year 2000
First Coast - ADT	?	Retire – by the Year 2000	First Coast -Fixed Assets	?	Retire/Obsolete
First Coast -Fixed Assets	?	Retire/Obsolete	First Coast -General Ledger	?	Retire/Obsolete
First Coast -General Ledger	?	Retire/Obsolete	First Coast - Materials Management	?	Retire – by the Year 2000
First Coast - Materials Management	?	Retire – by the Year 2000	First Coast -Medical Records	?	Retire – by the Year 2000
First Coast -Medical Records	?	Retire – by the Year 2000	First Coast - Order Communications	?	Retire/Obsolete
First Coast - Order Communications	?	Retire/Obsolete	First Coast - Patient Accounting	?	Retire – by the Year 2000
First Coast - Patient Accounting	?	Retire – by the Year 2000	First Coast- Payroll/Timekeeping	?	Retire – by the Year 2000
First Coast- Payroll/Timekeeping	?	Retire – by the Year 2000	First Coast – Surgery Management	?	Replace – ORSOS
First Coast – Surgery Management	?	Replace – ORSOS	First Coast – Work/Wellness, Walk	?	Retire/Obsolete
First Coast – Work/Wellness, Walk	?	Retire/Obsolete	Global – Accounts Payable	N	Vendor Upgrade – Suite 2000, available 3/9/1998
Global – Accounts Payable	N	Vendor Upgrade – Suite 2000, available 3/9/1998	Global – Fixed Assets	N	Vendor Upgrade – Suite 2000, available 3/9/1998
Global – Fixed Assets	N	Vendor Upgrade – Suite 2000, available 3/9/1998	Global – General Ledger	N	Vendor Upgrade – Suite 2000, available 3/9/1998
Global – General Ledger	N	Vendor Upgrade – Suite 2000, available 3/9/1998	Global – Global Link (EDI)	N	Upgrade to Version 5.10 – currently available
Global – Global Link (EDI)	N	Upgrade to Version 5.10 – currently available	Global – Global View Report Writer	N	Vendor Upgrade – Suite 2000, available 3/9/1998
Global – Global View Report Writer	N	Vendor Upgrade – Suite 2000, available 3/9/1998	Global – Materials Management	N	Vendor Upgrade – Suite 2000, available 3/9/1998
Global – Materials Management	N	Vendor Upgrade – Suite 2000, available 3/9/1998	HIS – Admittance System	?	Replace – Under Analysis
HIS – Admittance System	?	Replace – Under Analysis	HIS – Admitting	?	Replace – IDX
HIS – Admitting	?	Replace – IDX	HIS – Calendar	?	Unknown
HIS – Calendar	?	Unknown	HIS – Carenet Functions and History	?	Unknown
HIS – Carenet Functions and History	?	Unknown	HIS – Charge Entry System	?	Replace – IDX or Medtech
HIS – Charge Entry System	?	Replace – IDX or Medtech	HIS – Common Edit (CECS)	?	Retire by 2000, when HISS goes away
HIS – Common Edit (CECS)	?	Retire by 2000, when HISS goes away	HIS – Computer Billing (COMB)	?	Replace – Medtech
HIS – Computer Billing (COMB)	?	Replace – Medtech	HIS – Department Patient Notes	?	Replace – Medtech
HIS – Department Patient Notes	?	Replace – Medtech	HIS – Discharge History	?	Retire – by the year 2000
HIS – Discharge History	?	Retire – by the year 2000	HIS – Discharge Summary	?	Replace – Data Repository
HIS – Discharge Summary	?	Replace – Data Repository	HIS – Emergency Department Log	?	Replace – IDX
HIS – Emergency Department Log	?	Replace – IDX	HIS – Event Booking	?	Replace – under analysis
HIS – Event Booking	?	Replace – under analysis	HIS – Financial Decision Support (Feed Payroll)	?	Replace – Peoplesoft
HIS – Financial Decision Support (Feed Payroll)	?	Replace – Peoplesoft	HIS – Game	?	Retire by 2000, when HISS goes away
HIS – Game	?	Retire by 2000, when HISS goes away	HIS – Inpatient	?	Retire by 2000, when HISS goes away
HIS – Inpatient	?	Retire by 2000, when HISS goes away	HIS – Lab Order Entry/Results Reporting	?	Replace – Medtech
HIS – Lab Order Entry/Results Reporting	?	Replace – Medtech	HIS – Locator	?	Replace – under analysis
HIS – Locator	?	Replace – under analysis	HIS – Monitor	?	Retire by 2000, when HISS goes away
HIS – Monitor	?	Retire by 2000, when HISS goes away	HIS – Notebook	?	Retire – under analysis
HIS – Notebook	?	Retire – under analysis	HIS – Nurse Appointment Scheduling	?	Replace – IDX
HIS – Nurse Appointment Scheduling	?	Replace – IDX	HIS – Nursing Careplan	?	Retire – Medtech
HIS – Nursing Careplan	?	Retire – Medtech	HIS – Nursing Notes	?	Replace – Medtech
HIS – Nursing Notes	?	Replace – Medtech	HIS – Office Policies/Procedures, Word Processing	?	Retire
HIS – Office Policies/Procedures, Word Processing	?	Retire	HIS – Operating Room Activity	?	Replace – ORSOS
HIS – Operating Room Activity	?	Replace – ORSOS	HIS – Order Communications (nursing)	?	Replace – Medtech
HIS – Order Communications (nursing)	?	Replace – Medtech	HIS – Patient Appointment Scheduling	?	Retire/Obsolete
HIS – Patient Appointment Scheduling	?	Retire/Obsolete	HIS – Patient Billing	?	Replace – IDX
HIS – Patient Billing	?	Replace – IDX	HIS – Patient List Print Programs – Nursing	?	Replace – Medtech
HIS – Patient List Print Programs – Nursing	?	Replace – Medtech	HIS – Payroll	?	Replace – Peoplesoft
HIS – Payroll	?	Replace – Peoplesoft	HIS – Pharmacy	?	Replace – Medtech
HIS – Pharmacy	?	Replace – Medtech	HIS – Physician Patient List – Nursing	?	Replace – Medtech
HIS – Physician Patient List – Nursing	?	Replace – Medtech	HIS – Problem Analysis and Recording	?	Replace – under analysis
HIS – Problem Analysis and Recording	?	Replace – under analysis	HIS – Program Inventory	?	Retire by 2000, when HISS goes away
HIS – Program Inventory	?	Retire by 2000, when HISS goes away	HIS – Radiology	?	Replace – DX Radiology, Mar 1998
HIS – Radiology	?	Replace – DX Radiology, Mar 1998	HIS – Remittances	?	Retire by 2000
HIS – Remittances	?	Retire by 2000	HIS – Report Writers	?	Retire by 2000, when HISS goes away
HIS – Report Writers	?	Retire by 2000, when HISS goes away	HIS – Security/Program Inv.	?	Retire by 2000, when HISS goes away
HIS – Security/Program Inv.	?	Retire by 2000, when HISS goes away	HIS – Surgical Preference Card	?	Replace – ORSOS, mid 1998
HIS – Surgical Preference Card	?	Replace – ORSOS, mid 1998	HIS – Tumor Registry	?	Replace – ORSOS, mid 1998
HIS – Tumor Registry	?	Replace – ORSOS, mid 1998	HIS – Tumor Registry (Part of Payroll)	?	Replace – ORSOS, mid 1998
HIS – Tumor Registry (Part of Payroll)	?	Replace – ORSOS, mid 1998	IDX – AEM Upgrade Tool, V. 1	N	Upgrade to New Release – Version 8.4 in 1998
IDX – AEM Upgrade Tool, V. 1	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Billing/Accounts Receivable, V. 1.7	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Billing/Accounts Receivable, V. 1.7	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Chart Completion	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Chart Completion	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Chart Tracking	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Chart Tracking	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Compensation	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Compensation	N	Upgrade to New Release – Version 8.4 in 1998	IDX – DBMS/Reporting Tools/ARIES V. 7	N	Upgrade to New Release – Version 8.4 in 1998
IDX – DBMS/Reporting Tools/ARIES V. 7	N	Upgrade to New Release – Version 8.4 in 1998	IDX – EDI V. 8	N	Upgrade to New Release – Version 8.4 in 1998
IDX – EDI V. 8	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Encoder (from Omnicore) (ESD) V. 7	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Encoder (from Omnicore) (ESD) V. 7	N	Upgrade to New Release – Version 8.4 in 1998	IDX – EPR (Attached To ADTHPA Link)	N	Upgrade to New Release – Version 8.4 in 1998
IDX – EPR (Attached To ADTHPA Link)	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Fax Patient Acc. (ADTHPA), V. 8	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Fax Patient Acc. (ADTHPA), V. 8	N	Upgrade to New Release – Version 8.4 in 1998	IDX – HISS	N	Upgrade to New Release – Version 8.4 in 1998
IDX – HISS	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Managed Care Systems, V. 8	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Managed Care Systems, V. 8	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Patient Scheduling (Sched)	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Patient Scheduling (Sched)	N	Upgrade to New Release – Version 8.4 in 1998	IDX – PCS (Peoplesoft Coll), V. 7	N	Upgrade to New Release – Version 8.4 in 1998
IDX – PCS (Peoplesoft Coll), V. 7	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Radiology	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Radiology	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Reporting Modules (home grown)	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Reporting Modules (home grown)	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Security Plus, V. 7	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Security Plus, V. 7	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Turnover Tool (TTS) v. 7	N	Upgrade to New Release – Version 8.4 in 1998
IDX – Turnover Tool (TTS) v. 7	N	Upgrade to New Release – Version 8.4 in 1998	IDX – Vapor Ver 1.1	N	Replace – Data Repository
IDX – Vapor Ver 1.1	N	Replace – Data Repository	Medical Staff Info (Horizons)	?	Upgrade to New Release, available January 1998
Medical Staff Info (Horizons)	?	Upgrade to New Release, available January 1998	Meditech	?	Vendor upgrade – Available mid 1998
Meditech	?	Vendor upgrade – Available mid 1998	OBnet Obstetrics Record	Y	Diveta indicates compliance
OBnet Obstetrics Record	Y	Diveta indicates compliance	OBScan 4	?	Unknown
OBScan 4	?	Unknown	ORSOS	?	Upgrade to new release, available June 1998
ORSOS	?	Upgrade to new release, available June 1998	PAS Abstraction	?	Replace – New app. To access IDX
PAS Abstraction	?	Replace – New app. To access IDX	Peoplesoft – Benefits Administration	Y	Vendor indicates compliance
Peoplesoft – Benefits Administration	Y	Vendor indicates compliance	Peoplesoft – HR Management System	Y	Vendor indicates compliance
Peoplesoft – HR Management System	Y	Vendor indicates compliance	Peoplesoft – Payroll	Y	Vendor indicates compliance
Peoplesoft – Payroll	Y	Vendor indicates compliance	Peoplesoft – Reports (Applicant Tracking)	Y	Vendor indicates compliance
Peoplesoft – Reports (Applicant Tracking)	Y	Vendor indicates compliance	Physion – COI Compliance (Utilization Review)	Y	Vendor – working on a release
Physion – COI Compliance (Utilization Review)	Y	Vendor – working on a release	Resource Scheduling (Fancy Allen system)	?	Retire/Obsolete
Resource Scheduling (Fancy Allen system)	?	Retire/Obsolete	Smart Mailer - LetterShip	?	Unknown
Smart Mailer - LetterShip	?	Unknown	STIX	Y	Vendor indicates compliance
STIX	Y	Vendor indicates compliance	VIMENET (Email)	?	Replace – email package
VIMENET (Email)	?	Replace – email package			

Asset Inventory

<i>Disposition:</i>	<i>Y2K ok?</i>	<i>Y</i>	<i>N</i>	<i>?</i>	<i>Totals</i>
Retire or Retire/Obsolete				26	26
Replace			1	31	32
Unknown (not decided)				7	7
Vendor indicates compliance		9		8	17
Vendor upgrade planned		6	18	1	25
Totals		15	19	73	107

Y2K status of 73 applications = questionable (“?”)

Decisions needed:

- **26 to retire** – may not need to analyze these systems
- **31 to replace** – with new software (i.e. Meditech, IDX, Peoplesoft, ORSOS, ANSAS or other projects)
- **7 applications are undecided** – (e.g. IBM Medical Records Encoder) Solution may be to do in-house analysis and remediation or replacement
- **8 need to be assessed for vendor compliance**
- **1 needs to be assessed for vendor upgrade**

Applications Supported by Fletcher Allen Information Services		
System Name	Y2K OK?	Plans for Compliance
EDI Encoder - Medical Records Encoder	?	Unknown
EDI Encoder - Medical Records Encoder M/R	?	Replace - 3rd Encoder, OX Integrated
ANSAS	?	
Applis	?	Vendor indicates compliance
Bones	?	Retire/Obsolete
Clinical Financial Information System (CFIS)	?	Retire/Obsolete
Clinical Data Entry	?	Retire/Obsolete
Coventry/HCI Interface Engine	?	Vendor indicates compliance
Cost Repository - ORSOS	?	Vendor indicates compliance
Cost Warehouse - Cognos	?	Vendor indicates compliance
Cost Warehouse - Cost Entries	?	
Cost Warehouse - Medgen	?	Retire
Cost Warehouse - Redrick	?	Vendor indicates compliance
Customer Order Database, Enterprise Voice	?	Vendor indicates compliance
Customer - Enterprise Text	?	Vendor indicates compliance
CRU Upgrade	?	Retire/Obsolete
First Coast - Accounts Payable	?	Retire - by the year 2000
First Coast - ACT	?	Retire - by the year 2000
First Coast - Fixed Assets	?	Retire/Obsolete
First Coast - General Ledger	?	Retire/Obsolete
First Coast - Inventory Management	?	Retire - by the year 2000
First Coast - Medical Records	?	Retire - by the year 2000
First Coast - Order Communications	?	Retire/Obsolete
First Coast - Special Accounting	?	Retire - by the year 2000
First Coast - Payroll/Timekeeping	?	Retire - by the year 2000
First Coast - Supply Management	?	Replace - ORSOS
First Coast - Work/Witness Walk	?	Retire/Obsolete
Genoa - Accounts Payable	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Genoa - Fixed Assets	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Genoa - General Ledger	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Genoa - Goods In/Out (GIL)	N	Upgrade to Version 5.0 - currently available
Genoa - Goods View Report Writer	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Genoa - Materials Management	N	Vendor Upgrade - Suite 2000, available 3/9/1998
HS - Accounts Receivable	?	Retire - by the year 2000
HS - Address Label System	?	Replace - under analysis
HS - Billing	?	Replace - OK
HS - Calendar	?	Unknown
HS - Clinical Functions and History	?	Unknown
HS - Charge Entry System	?	Replace - OX or Medison
HS - Common EDI (CEES)	?	Retire by 2000, when HIS goes away
HS - Computer Pricing (CPM)	?	Retire by 2000, when HIS goes away
HS - Department Patient Notes	?	Replace - Meditech
HS - Orders	?	Replace - Medison
HS - Outpatient History	?	Retire - by the year 2000
HS - Outpatient Summary	?	Replace - Cost Repository
HS - Outpatient Department Log	?	Replace - OK
HS - Event Booking	?	Replace - under analysis
HS - Financial/Decision Support (Free Payroll)	?	Replace - in progress
HS - Forms	?	Retire by 2000, when HIS goes away
HS - Inpatient	?	Retire by 2000, when HIS goes away
HS - Lab Order Entry/Results Reporting	?	Replace - Meditech
HS - Location	?	meditech
HS - Materials	?	Retire by 2000, when HIS goes away
HS - Notebook	?	Replace - under analysis
HS - Nurse Appointment Scheduling	?	Replace - OX
HS - Nursing Codes	?	Replace - Meditech
HS - Nursing Notes	?	Replace - Meditech
HS - Office Process/Inpatient, Asset Processing	?	Retire
HS - Operating Room Activity	?	Replace - ORSOS
HS - Order Communications (Billing)	?	Replace - Meditech
HIS - Patient Appointment Scheduling	?	Retire/Obsolete
HIS - Patient Billing	?	Replace - OX
HIS - Patient List Print Programs - Nursing	?	Replace - Meditech
HIS - Pharmacy	?	Replace - Peoplesoft
HIS - Pharmacy	?	Replace - Meditech
HIS - Precious Patient List - Nursing	?	Replace - Meditech
HIS - Problem Analysis and Reporting	?	Replace - under analysis
HIS - Program Inventory	?	Retire by 2000, when HIS goes away
HIS - Radiology	?	Replace - EV Radiology, Mid-1998
HIS - Reimbursements	?	Retire by 2000
HIS - Report Writers	?	Retire by 2000, when HIS goes away
HIS - Security/Program Inv.	?	Retire by 2000, when HIS goes away
HIS - Surgical Services Unit	?	Replace - ORSOS, mid-1998
HIS - Title Process Management (CPV)	?	Retire by 2000, when HIS goes away
HIS - Time/Attendance (Part of Payroll)	?	Replace - One Staff???
HIS - User Registry	?	Replace - ORSOS/CPV
EDI - AEM Upgrade Tool, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Billing/Accounts Receivable, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Chart Completion	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Chart Tracking, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Correspondence Log	N	Upgrade to New Release - Version 8.4 in 1998
EDI - DEMS/Report Writer/AS V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - ESI, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Encounter Form Generator (EFG), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - EMAS (Sched. To AD/HPA/ASA)	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Hospital Patient List, AD/HPA, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Inpatient	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Managed Care Systems, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Patient Scheduling (Sched)	N	Upgrade to New Release - Version 8.4 in 1998
EDI - PCS (Patient To AD/HPA/ASA)	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Radiology	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Reporting Modules (Home grown)	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Security Plan, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - Turnover Tool (TUS), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
EDI - User Ver 1.1	N	Replace - Data Repository
Medical Staff Info. History	?	Upgrade to New Release, available January 1998
Meditech	?	Vendor upgrade - Available mid-1998
Other/Systems Record	?	Client indicates compliance
OBScan 4	?	Unknown
ORIS	?	Upgrade to new release, available June 1998
PAS Abstractor	?	Replace - New app. to access OX
PeopleSoft - Benefits Administration	?	Vendor indicates compliance
PeopleSoft - HR Management System	?	Vendor indicates compliance
PeopleSoft - Payroll	?	Vendor indicates compliance
PeopleSoft - Patient Appointment Tracking	?	Vendor indicates compliance
PeopleSoft - CR/Compass Utilization Review	?	Vendor working on a release
Resource Scheduling (Fancy Allen system)	?	Retire/Obsolete
Smart Mailer - Lendbridge	?	Unknown
STIX	?	Vendor indicates compliance
VTMECNET (Email)	?	Replace - email package

System Name	Y2K OK?	Plans for Compliance
IBM Encoder - Medical Records Encoder	?	Unknown
IBM Encoder - Medical Records Encoder MIF	?	Replace - 3M Encoder, iDX Integrated
ANCS	?	?
Appla	Y	Vendor indicates compliance
Bones	?	Retire/Obsolete
Clinical Financial Information System (CFIS)	?	Retire/Obsolete
Clinical Data Editor	?	Retire/Obsolete
Cloverleaf/HCI Interface Engine	?	Vendor indicates compliance
Daab Repository - Oasis	?	Vendor indicates compliance
Daab Warehouse - Cognos	?	Vendor indicates compliance
Daab Warehouse - Data Extracts	?	?
Daab Warehouse - Metagor	?	Retire
Daab Warehouse - Redbrick	?	Vendor indicates compliance
Dictaphone - Digital Dictation, Enterprise Voice	Y	Vendor indicates compliance
Dictaphone - Enterprise Text	Y	Vendor indicates compliance
ORG Groupier	?	Retire/Obsolete
First Coast - Accounts Payable	?	Retire - by the Year 2000
First Coast - ADT	?	Retire - by the Year 2000
First Coast - Fixed Assets	?	Retire/Obsolete
First Coast - General Ledger	?	Retire/Obsolete
First Coast - Materials Management	?	Retire - by the Year 2000
First Coast - Medical Records	?	Retire - by the Year 2000
First Coast - Order Communications	?	Retire/Obsolete
First Coast - Patient Accounting	?	Retire - by the Year 2000
First Coast - Payroll/Timekeeping	?	Retire - by the Year 2000
First Coast - Surgery Management	?	Retire - ORSOS
First Coast - Work/Wellness, Walk	?	Retire/Obsolete
Global - Accounts Payable	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - Fixed Assets	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - General Ledger	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - Global Link (EDI)	N	Upgrade to Version 5.10 - currently available
Global - Global View Report Writer	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - Materials Management	N	Vendor Upgrade - Suite 2000, available 3/9/1998
HIS - Accounts Receivable	?	Retire - by the year 2000
HIS - Address Label System	?	Replace - Under Analysis
HIS - Admitting	?	Replace - iDX
HIS - Calendar	?	Unknown
HIS - Census Functions and History	?	Unknown
HIS - Charge Entry System	?	Replace - iDX or Meditech
HIS - Common Edit (CECS)	?	Retire by 2000, when HISS goes away
HIS - Computer Billing (COMU)	?	Retire by 2000, when HISS goes away
HIS - Department Patient Notes	?	Replace - Meditech
HIS - Dietary	?	Replace - Meditech
HIS - Discharge History	?	Retire - by the year 2000
HIS - Discharge Summary	?	Replace - Data Repository
HIS - Emergency Department Log	?	Replaced - iDX
HIS - Event Booking	?	Replace - under analysis
HIS - Financial Decision Support (Feed Payroll)	?	Replace - Peoplesoft
HIS - Game	?	Retire by 2000, when HISS goes away
HIS - Interface	?	Retire by 2000, when HISS goes away
HIS - Lab Order Entry/Results Reporting	?	Replace - Meditech
HIS - Locator	?	Intellidisk
HIS - Monitor	?	Retire by 2000, when HISS goes away
HIS - Notebook	?	Replace - under analysis
HIS - Nurse Appointment Scheduling	?	Replace - iDX
HIS - Nursing Carexex	?	Replace - Meditech
HIS - Nursing Notes	?	Replace - Meditech
HIS - Office (Polio) Procedures, Word Processing)	?	Retire
HIS - Operating Room Activity	?	Replace - ORSOS
HIS - Order Communications (nursing)	?	Replace - Meditech
HIS - Patient Appointment Scheduling	?	Retire/Obsolete
HIS - Patient Billing	?	Replaced - iDX
HIS - Patient List Print Programs - Nursing	?	Replace - Meditech
HIS - Payroll	?	Replace - Peoplesoft
HIS - Pharmacy	?	Replace - Meditech
HIS - Physician Patient List - Nursing	?	Replace - Meditech
HIS - Problem Analysis and Recording	?	Replace - under analysis
HIS - Program Inventory	?	Retire by 2000, when HISS goes away
HIS - Radiology	?	Replace - iDX, Radiology, Mid-1998
HIS - Remittances	?	Retire by 2000
HIS - Report Writers	?	Retire by 2000, when HISS goes away
HIS - Security/Program Inv.	?	Retire by 2000, when HISS goes away
HIS - Surgical Preference Card	?	Replace - ORSOS, mid 1998
HIS - Lab Process Management (CPVT)	?	Retire by 2000, when HISS goes away
HIS - Time/Attendance (Part of Payroll)	?	Replace - One Star????
HIS - Tumor Registry	?	Replace - CANSURFAC
iDX - ADM (Upgrade Tool), V. 8	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Billing/Accounts Receivable, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Chart Completion	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Chart Tracking, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Correspondence Log	N	Upgrade to New Release - Version 8.4 in 1998
iDX - DBMS/Report Writer/AES, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - EDI V. 8	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Encounter Form Generator (EFG), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - EPMS (Sched. To ADTHPA Link)	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Hospital Patient Acc. (ADTHPA), V. 8	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Interfaces	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Managed Care Systems, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Patient Scheduling (Sched)	N	Upgrade to New Release - Version 8.4 in 1998
iDX - PCS (Paperless Coll), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Radiology	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Reporting Modules (home grown)	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Security Plan, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Turnover Tool (TUS), v. 7	N	Upgrade to New Release - Version 8.4 in 1998
iDX - Vipor Ver 1.1	N	Replace - Data Repository
Medical Staff Info (Horizons)	?	Upgrade to New Release, available January 1998
Meditech	?	Vendor upgrade - Available mid-1998
OB&Scan 4	Y	Oracle indicates compliance
OB&Scan 4	?	Unknown
ORSOS	?	Upgrade to new release, available June 1998
PAS Abstraction	?	Replace - New app. To access iDX
Peoplesoft - Benefits Administration	Y	Vendor indicates compliance
Peoplesoft - HR Management System	Y	Vendor indicates compliance
Peoplesoft - Payroll	Y	Vendor indicates compliance
Peoplesoft - Restruc. (Applicant Tracking)	Y	Vendor indicates compliance
Phyzoom - CID Compas (Utilization Review)	?	Vendor is working on a release
Resource Scheduling (Fanny Allen system)	?	Retire/Obsolete
Smart Mailer - LetterShip	?	Unknown
STIX	Y	Vendor indicates compliance
VTMEDNET (Email)	?	Replace - email package

What is the risk of replacement projects?

Disposition:	Y2K ok?	Y	N	?	Totals
Retire or Retire/Obsolete				26	26
Replace			1	31	32
Unknown (not decided)				7	7
Vendor indicates compliance		9		8	17
Vendor upgrade planned		6	18	1	25
Totals		15	19	73	107

Risks: Large replacement projects often fall behind schedule

- What impacts would falling behind scheduled cause?
- Would it be prudent to plan to remediate the 32 applications?
- Would it also be prudent to plan to remediate the 18 systems which the vendors plan to upgrade ?

What information is not in the table that we would like to see?

- Completion dates for each application to help in planning
- Relative size of each application (i.e. level of effort)
- Departmental applications not supported by the central Information System organization
- Facilities controls with embedded microprocessors not included in the inventory (e.g. elevators, HVAC, power systems,...)

System Name	Y2K OK?	Plans for Compliance
IBM Encoder - Medical Records Encoder	?	Unknown
IBM Encoder - Medical Records Encoder Mail	?	Replace - 3M Encoder, IDX Integrated
ANSOS	?	?
Applix	Y	Vendor indicates compliance
Bones	?	Retire/Obsolete
Clinical Financial Information System (CFIS)	?	Retire/Obsolete
Clinical Data Entry	?	Retire/Obsolete
Cloverleaf/HC Interface Engine	?	Vendor indicates compliance
Data Repository - Oasis	?	Vendor indicates compliance
Data Warehouse - Cognos	?	Vendor indicates compliance
Data Warehouse - Data Extracts	?	?
Data Warehouse - Metaphor	?	Retire
Data Warehouse - Resnick	?	Vendor indicates compliance
Dictaphone - Digital Dictation, Enterprise Voice	Y	Vendor indicates compliance
Dictaphone - Enterprise Text	Y	Vendor indicates compliance
CRG Group	?	Retire/Obsolete
First Coast - Accounts Payable	?	Retire - by Year 2000
First Coast - ADT	?	Retire - by Year 2000
First Coast - Fixed Assets	?	Retire/Obsolete
First Coast - General Ledger	?	Retire/Obsolete
First Coast - Materials Management	?	Retire - by Year 2000
First Coast - Medical Records	?	Retire - by Year 2000
First Coast - Order Communications	?	Retire/Obsolete
First Coast - Patient Accounting	?	Retire - by Year 2000
First Coast - Payroll/Timekeeping	?	Retire - by Year 2000
First Coast - Surgery Management	?	Replace - ORSOS
First Coast - Work/Welfare, Work	?	Retire/Obsolete
Global - Accounts Payable	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - Fixed Assets	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - General Ledger	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - Global Link (GL)	N	Upgrade to Version 5.10 - currently available
Global - Global View Report Writer	N	Vendor Upgrade - Suite 2000, available 3/9/1998
Global - Materials Management	N	Vendor Upgrade - Suite 2000, available 3/9/1998
HIS - Accounts Receivable	?	Retire - by year 2000
HIS - Address Label System	?	Replace - Under Analysis
HIS - Admitting	?	Replaces - IDX
HIS - Calendar	?	Unknown
HIS - Census Functions and History	?	Unknown
HIS - Charge Entry System	?	Replace - IDX or Meditech
HIS - Common EDI (CEDS)	?	Retire by 2000, when HIS5 goes away
HIS - Computer Billing (COMB)	?	Retire by 2000, when HIS5 goes away
HIS - Department Patient Notes	?	Replace - Meditech
HIS - Dietary	?	Replace - Meditech
HIS - Discharge History	?	Retire - by year 2000
HIS - Discharge Summary	?	Replace - Data Repository
HIS - Emergency Department Log	?	Replaces - IDX
HIS - Event Booking	?	Replace - under analysis
HIS - Financial Decision Support (Feed Payroll)	?	Replace - Peoplesoft
HIS - Game	?	Retire by 2000, when HIS5 goes away
HIS - Inpatient	?	Retire by 2000, when HIS5 goes away
HIS - Lab Order Entry/Results Reporting	?	Replace - Meditech
HIS - Locator	?	Inteltek
HIS - Monitor	?	Retire by 2000, when HIS5 goes away
HIS - Notebook	?	Replace - under analysis
HIS - Nurse Appointment Scheduling	?	Replaces - IDX
HIS - Nursing Calendar	?	Replace - Meditech
HIS - Nursing Notes	?	Replace - Meditech
HIS - Office (Policies/Procedures, Word Processing)	?	Retire
HIS - Operating Room Activity	?	Replace - ORSOS
HIS - Order Communications (nursing)	?	Replace - Meditech
HIS - Patient Appointment Scheduling	?	Retire/Obsolete
HIS - Patient Billing	?	Replaces - IDX
HIS - Patient List Print Programs - Nursing	?	Replace - Meditech
HIS - Payroll	?	Replace - Peoplesoft
HIS - Pharmacy	?	Replace - Meditech
HIS - Physician Patient List - Nursing	?	Replace - Meditech
HIS - Problem Analysis and Recording	?	Replace - under analysis
HIS - Program Inventory	?	Retire by 2000, when HIS5 goes away
HIS - Radiology	?	Replace - IDX Radiology, Mid-1998
HIS - Remittances	?	Retire by 2000
HIS - Report Writers	?	Retire by 2000, when HIS5 goes away
HIS - Security/Program Inv	?	Retire by 2000, when HIS5 goes away
HIS - Surgical Preference Card	?	Replace - ORSOS, mid 1998
HIS - Tele Process Management (CPVT)	?	Retire by 2000, when HIS5 goes away
HIS - Time/Attendance (Part of Payroll)	?	Replace - One Star777?
HIS - Tumor Registry	?	Replace - CANSURFAC
IDX - ADM (Upgrade Tool), V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Billing/Accounts Receivable, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Chart Completion	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Chart Tracking, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Correspondence Log	N	Upgrade to New Release - Version 8.4 in 1998
IDX - OBMS/Report Writer/AES, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - EDI, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Encounter Form Generator (EFG), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - EPMS (Sched. To ADT/HPA Link)	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Hospital Patient Acc. (ADTHPA), V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Interfaces	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Managed Care Systems, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Patient Scheduling (Sched)	N	Upgrade to New Release - Version 8.4 in 1998
IDX - PCS (Paperless Coll), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Radiology	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Reporting Modules (Home grown)	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Security Plus, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Turnover Tool (TUS), v. 7	N	Upgrade to New Release - Version 8.4 in 1998
IDX - Vigor Ver 1.1	N	Replace - Data Repository
Medical Staff Info (Horizons)	?	Upgrade to New Release, available January 1998
Meditech	?	Vendor upgrade - Available mid-1998
OBNet Obstetrics Record	?	Direct indicates compliance
OBScan 4	?	Unknown
ORSOS	?	Upgrade to new release, available June 1998
PAS Abstraction	?	Replace - New app. To access IDX
Peoplesoft - Benefits Administration	Y	Vendor indicates compliance
Peoplesoft - HR Management System	Y	Vendor indicates compliance
Peoplesoft - Payroll	Y	Vendor indicates compliance
Peoplesoft - Restruct (Applicant Tracking)	Y	Vendor indicates compliance
Phycom - CO Compass (Utilization Review)	?	Vendor is working on a release
Resource Scheduling (Fanny Allen system)	?	Retire/Obsolete
Smart Mailer - Lettering	?	Unknown
STIX	?	Vendor indicates compliance
VIMEDNET (Email)	?	Replace - email package

All missing from this exhibit are...

Patient Care Risks	Administrative Risks

4. How is the Year 2038 problem similar to and different from the Year 2000 bug?

A signed 4-byte integer has a maximum value of 2,147,483,647, and this is where the Year 2038 problem comes from

- The maximum value of time before it rolls over to a negative (and invalid) value is 2,147,483,647, which translates into January 19, 2038
- On this date, any programs written in the 'C' programming language which use a standard time library will have problems with date calculations

How is the Year 2038 problem similar and different?

Most web-based systems and services that run over the Internet are based on Linux!

Linux and many programs are written in C programming language and suffer from the Year 2038 problem

- Most C programs use a library of routines called **standard time library**
- This library uses a standard 4-byte or 32 bit format to store time values, and provides functions for converting, displaying and calculating time values

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- The standard time library assumes the beginning of time is January 1, 1970, at 12:00:00 a.m. This value is 0
- Any time/date value is expressed as the number of seconds following that zero value. So the time value is that many seconds past 12:00:00 a.m. on January 1, 1970
 - This is convenient because if you subtract any two values, you get the time difference between them in seconds
 - Other functions in the library are used to determine how many minutes/hours/days/months/years have passed between two times

Other questions if there is time...

Y2K exposed Fletcher-Allen to significant business and medical risks

Bob Sadlemire's boss Alan Wyman, tells him:

"You need to assure (the Board) that we have a solid process in place to deal with (the year 2000 problem)."

If you were Sadlemire, can you state that the process is "solid"? Why/why not?

Task Area	Exposures
1. Application Systems	Overall – will be in good shape
2. Technical Systems	None; manageable situation
3. Clinical Equipment	Not many issues identified or expected
4. Facilities	Few issues expected
5. Telecommunications	Procurement; local exchanges
6. Suppliers	Yet to determine; potentially significant
7. Payors	Staff and cash flow implications

Does the summary of Exhibit 1 "Agenda for upcoming Board's Patient Care and Systems Improvement committee meeting" seem misleading?

Y2K exposed Fletcher-Allen to significant business and medical risks

Bob Sadlemire's boss Alan Wyman, tells him:

"You need to assure (the Board) that we have a solid process in place to deal with (the year 2000 problem)."

What do you think of these instructions?

If you were Sadlemire, can you state that the process is "solid"? Why/why not?

How likely is it that Bob Sadlemire can guide the organization to achieve Y2K compliance in their critical medical and business processes?

Success of an enterprise-wide IT initiative is based on what?

...is not merely a technical problem to be “solved” by IT professionals

Implementation of new or altered enterprise systems will have a large impact on every business process

Therefore extensive participation and active oversight by influential senior managers is necessary!