

MIS5206
Protecting Information Assets
– Unit #8 –

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





Agenda

- [In the News](#)
- Midterm Exam Review
- Case Study 3 – A Hospital Catches the “Millennium Bug”





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The GREATEST benefit of having well-defined data categorization policies and procedures is:

A decreased cost of controls	8 respondents	73 %	 ✓
A more accurate inventory of information assets	1 respondent	9 %	
An improved regulatory compliance	1 respondent	9 %	
A reduced risk of inappropriate system access	1 respondent	9 %	





While auditing an e-commerce architecture, an IS auditor notes that customer master data are stored on the web server for six months after the transaction date and then purged due to inactivity. Which of the following should be the PRIMARY concern for the IS auditor?

System storage performance		0 %	
Availability of customer data	2 respondents	18 %	
Integrity of customer data	6 respondents	55 %	
Confidentiality of customer data	3 respondents	27 %	 ✓





Who are responsible for ensuring that the information security policies and procedures have been adhered to?

Executive management	1 respondent	9 %	
Security officers	3 respondents	27 %	
Information owners	5 respondents	45 %	
Information systems auditors	2 respondents	18 %	 ✓

The information security manager should treat regulatory compliance as:

An organizational mandate	2 respondents	18 %	
A purely operational issue		0 %	
A risk management priority	2 respondents	18 %	
Another risk to be managed	7 respondents	64 %	 ✓

One of the primary steps in a quantitative risk analysis is to determine the annualized loss expectancy (ALE). How is the ALE calculated?

Asset value + (Single loss expectancy / Frequency per year)	1 respondent	9 %	
Asset value X 2.8		0 %	
Single loss expectancy X Frequency per year	8 respondents	73 %	 ✓
Single loss expectancy / Frequency per year	2 respondents	18 %	

When helping an organization understand the business context of information resources that support critical functions and the cyber security risks they face, the team should first create a list of information assets. What should happen next?

Determine the risks facing the asset	2 respondents	18 %	
Identify threats facing each asset	3 respondents	27 %	
Identify vulnerabilities in each asset		0 %	
Develop a value for each asset	6 respondents	55 %	✓

An IS auditor is reviewing the physical security controls of a data center and notices several areas for concern. Which of the following areas is the MOST important?

The emergency exit door is blocked.	7 respondents	64 %	✓
The emergency power off button cover is missing.	1 respondent	9 %	
There are no security cameras inside the data center.	1 respondent	9 %	
Scheduled maintenance of the fire suppression system was not performed.	2 respondents	18 %	

MIS 5206 PROTECTING INFORMATION ASSETS

When auditing security for a data center, an IS auditor should look for the presence of a voltage regulator to ensure that the:

hardware is protected against power surges.	8 respondents	73 %	✓
integrity is maintained if the main power is interrupted.	1 respondent	9 %	
hardware is protected against long-term power fluctuations.	1 respondent	9 %	
immediate power will be available if the main power is lost.	1 respondent	9 %	

Which of the following environmental controls is appropriate to protect computer equipment against short-term reductions in electrical power?

Interruptible power supplies		0 %	
Surge protection devices		0 %	
Power line conditioners	8 respondents	73 %	✓
Alternative power supplies	3 respondents	27 %	





Correct Answer

When developing a risk management program, what is the FIRST activity to be performed?





Classification of data	2 respondents	18 %	
Inventory of assets	8 respondents	73 %	✓
Criticality analysis	1 respondent	9 %	
Threat assessment		0 %	

Incorrect Answer





What is a risk associated with attempting to control physical access to sensitive areas such as computer rooms using card keys or locks?

Unauthorized individuals wait for controlled doors to open and walk in behind those authorized.	7 respondents	64 %	 ✓
Removing access for those who are no longer authorized is complex.		0 %	
The contingency plan for the organization cannot effectively test controlled access practices.		0 %	
Access cards, keys and pads can be easily duplicated allowing easy compromise of the control.	4 respondents	36 %	





An IS auditor is reviewing an organization's security operation center (SOC). Which of the following choices is of greatest concern? The use of:

a rented rack space in the SOC.	2 respondents	18 %	
a carbon dioxide-based fire suppression system.	4 respondents	36 %	 ✓
a wet pipe-based fire suppression system.	1 respondent	9 %	
an uninterrupted power supply with 5 minutes of backup power.	4 respondents	36 %	

Which of the following is the BEST criterion for evaluating the adequacy of an organization's security awareness program?

No actual incidents have occurred that have caused a loss or a public embarrassment.	1 respondent	9 %	
Senior management is aware of critical information assets and demonstrates an adequate concern for their protection	4 respondents	36 %	
Job descriptions contain clear statements of accountability for information security.	6 respondents	55 %	 ✓
In accordance with the degree of risk and business impact, there is adequate funding for security efforts.		0 %	

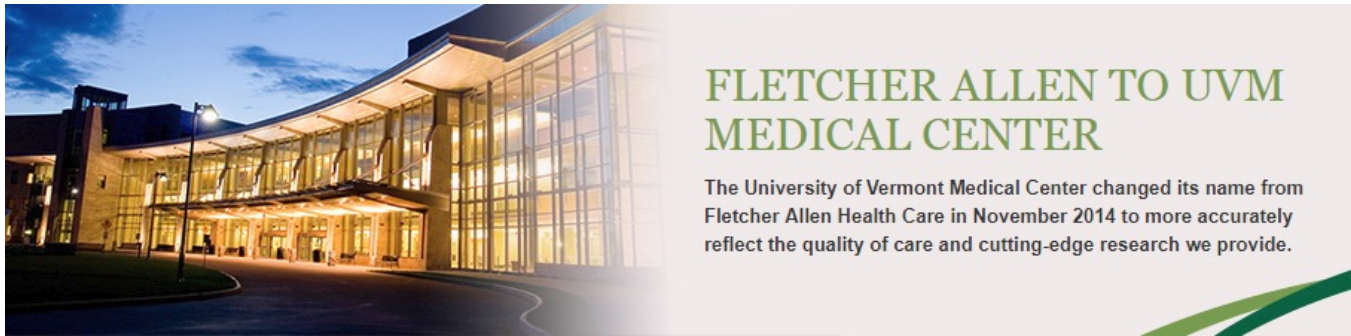
Which of the following would be BEST prevented by a raised floor in the computer machine room?

A power failure from static electricity		0 %	
Water flood damage	9 respondents	82 %	
Shocks from earthquakes		0 %	
Damage to wires around computers and servers	2 respondents	18 %	 ✓

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A Hospital Catches the “Millennium Bug”



Case Team Exercise: In your project teams, develop a Powerpoint presentation that covers the following 4 questions:

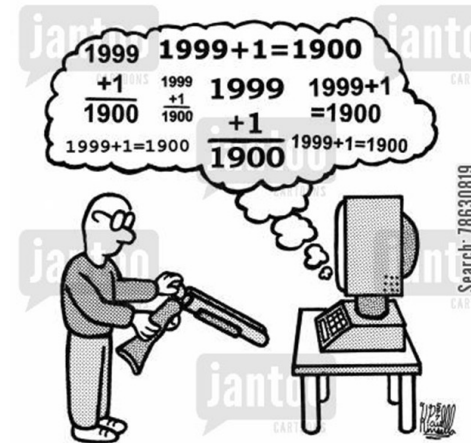
1. Describe the IT threat caused by the Year 2000 bug
2. From an information security perspective, how would you characterize the millennium (“Y2k”) bug and assess the risk from it that Fletcher-Allen Health Care faced in May 1998 ?
3. How would you assess the hospital’s readiness to control the risk ?
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 ?

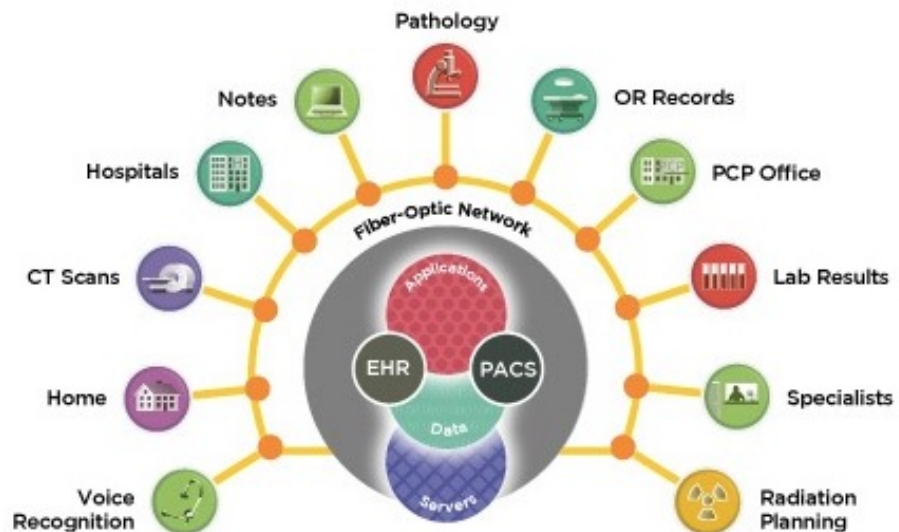
	POTENTIAL IMPACT		
Security Objective	LOW	MODERATE	HIGH
<p>Confidentiality Preserving authorized restrictions on information access and disclosure, including means for protecting personal privacy and proprietary information. [44 U.S.C., SEC. 3542]</p>	<p>The unauthorized disclosure of information could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



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		
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	?	
Applix	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
Data Repository – Oasis	?	Vendor indicates compliance
Data Warehouse – Cognos	?	Vendor indicates compliance
Data Warehouse – Data Extracts	?	
Data Warehouse – Metaphor	?	Retire
Data Warehouse – Redbrick	?	Vendor indicates compliance
Dictaphone -Digital Dictation, Enterprise Voice	Y	Vendor indicates compliance
Dictaphone – Enterprise Text	Y	Vendor indicates compliance
ORG Grouper	?	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	?	Replace – 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

Applications Supported by Fletcher-Allen Information Services		
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	?	
Applix	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
Data Repository – Oasis	?	Vendor indicates compliance
Data Warehouse – Cognos	?	Vendor indicates compliance
Data Warehouse – Data Extracts	?	
Data Warehouse – Metaphor	?	Retire
Data Warehouse – Redbrick	?	Vendor indicates compliance
Dictaphone -Digital Dictation, Enterprise Voice	Y	Vendor indicates compliance
Dictaphone – Enterprise Text	Y	Vendor indicates compliance
ORG Grouper	?	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	?	Replace – 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

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

Applications Supported by Fletcher-Allen Information Services		
System Name	Y2K OK?	Plans for Compliance
EM Encoder - Medical Records Encoder	?	Unknown
EM Encoder - Medical Records Encoder MF	?	Replace - EM Encoder I/OX integrated
ANCO	?	Vendor indicates compliance
ARSA	?	Vendor indicates compliance
ARNS	?	Retire/Obsolete
Clinical Financial Information System (CFIS)	?	Retire/Obsolete
Clinical Data Editor	?	Retire/Obsolete
Coverwalk/Intraface Engine	?	Vendor indicates compliance
Cost Repository - Cost	?	Vendor indicates compliance
Cost Warehouse - Cognos	?	Vendor indicates compliance
Cost Warehouse - Cost Extracts	?	Retire
Cost Warehouse - Integrator	?	Retire
Cost Warehouse - Radbrick	?	Vendor indicates compliance
Disophone - Digital Dictation, Enterprise voice	?	Vendor indicates compliance
Disophone - Enterprise TSP	?	Vendor indicates compliance
ORF Groupset	?	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	?	Replace - ORCOS
First Coast - Work/Warehouse, 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 (GLS)	N	Upgrade to Version 8.15 - 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 - Anesthlog	?	Replace - I/OX
HIS - Candler	?	Unknown
HIS - Campus Functions and history	?	Unknown
HIS - Charge Entry System	?	Replace - I/OX or Meditech
HIS - Common Edt (CEDE)	?	Retire by 2000, when HISB goes away
HIS - Computer Billing (COBIL)	?	Retire by 2000, when HISB goes away
HIS - Department Patient Notes	?	Replace - Meditech
HIS - Delivery	?	Replace - Meditech
HIS - Discharge History	?	Retire - by the year 2000
HIS - Discharge Summary	?	Replace - Cost Repository
HIS - Emergency Department Log	?	Replace - I/OX
HIS - Event Booking	?	Replace - under analysis
HIS - Financial Decision Support (Feed Payroll)	?	Replace - PeopleSoft
HIS - Billing	?	Retire by 2000, when HISB goes away
HIS - Interface	?	Retire by 2000, when HISB goes away
HIS - Lab Order Entry/Results Reporting	?	Replace - Meditech
HIS - Locator	?	meditech
HIS - Monitor	?	Retire by 2000, when HISB goes away
HIS - Notebook	?	Replace - under analysis
HIS - Nurse Appointment Scheduling	?	Replace - Meditech
HIS - Nursing Center	?	Replace - Meditech
HIS - Nurse Unit	?	Replace - Meditech
HIS - Office (Policies/Procedures, Work Processing)	?	Retire
HIS - Operating Room Activity	?	Replace - ORCOS
HIS - Order Communications (ordering)	?	Replace - Meditech
HIS - Patient Appointment Scheduling	?	Retire/Obsolete
HIS - Patient Billing	?	Replace - I/OX
HIS - Patient List (Prel 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 HISB goes away
HIS - Radiology	?	Replace - I/OX Radiology, Mid-1998
HIS - Remittances	?	Retire by 2000
HIS - Report Writer	?	Retire by 2000, when HISB goes away
HIS - Support Program Inv.	?	Retire by 2000, when HISB goes away
HIS - Surgical Preference Card	?	Replace - ORCOS mid 1998
HIS - Title Records Management (CRVT)	?	Retire by 2000, when HISB goes away
HIS - Time/Absence (Part of Payroll)	?	Replace - One Star????
HIS - Turnover Registry	?	Replace - CANSURFAC
IX - AOM (Upgrade Tool), V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IX - Billing/Accounts Receivable, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - Chart Completion	N	Upgrade to New Release - Version 8.4 in 1998
IX - Chart Tracking, v. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - Correspondence Log	N	Upgrade to New Release - Version 8.4 in 1998
IX - EMB/Report Writer/IES, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - EDI V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IX - Encounter Form Generator (EFG), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - EPKS (Sheet for ADT/PAL), v. 8	N	Upgrade to New Release - Version 8.4 in 1998
IX - Hospital Patient Acc. (ADT/PAL), V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IX - Inpatient	N	Upgrade to New Release - Version 8.4 in 1998
IX - Managed Care Systems, V. 8	N	Upgrade to New Release - Version 8.4 in 1998
IX - Patient Scheduling (Sheet)	N	Upgrade to New Release - Version 8.4 in 1998
IX - PCS (Paperless Cost), V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - Radiology	N	Upgrade to New Release - Version 8.4 in 1998
IX - Reporting Modules (Home grown)	N	Upgrade to New Release - Version 8.4 in 1998
IX - Security Risk, V. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - Turnover Tool (TUS), v. 7	N	Upgrade to New Release - Version 8.4 in 1998
IX - Viper Ver 1.1	N	Replace - Data Repository
Medical Staff Info (Historical)	?	Upgrade to New Release, available January 1998
Meditech	?	Vendor upgrade - Available mid-1998
OBNet Database Record	?	Direct indicates compliance
OBScan 4	?	Unknown
ORCOS	?	Upgrade to new release, available June 1998
PA3 Administration	?	Replace - New app. To access I/OX
PeopleSoft - Benefits Administration	?	Vendor indicates compliance
PeopleSoft - HR Management System	?	Vendor indicates compliance
PeopleSoft - Payroll	?	Vendor indicates compliance
PeopleSoft - Resorb (Applicant Tracking)	?	Vendor indicates compliance
Phycorn - CSD (Congress Utilization Review)	?	Vendor is working on a release
Resource Scheduling (Entry Admin system)	?	Retire/Obsolete
Smart Master - Letterhead	?	Unknown
STIX	?	Vendor indicates compliance
TYMEONE (Email)	?	Replace - email package

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,...)

All missing from this exhibit are...

Patient Care Risks	Administrative Risks

System Name	Y/N	OK?	Plans for Compliance
BM Encoder - Medical Records Encoder		Unknown	
BM Encoder - Medical Records Encoder MP		Replace - IM Encoder, CX integrated	
ARCS	Y		
ARCS	Y		Vendor indicates compliance
Bones	Y		Replace/Obsolete
Clinical Financial Information System (CFIS)	Y		Replace/Obsolete
Clinical Data Editor	Y		Replace/Obsolete
Coverleaf/C Interlock Engine	Y		Vendor indicates compliance
CRS Repository - CRIS	Y		Vendor indicates compliance
CRS Warehouse - Cognos	Y		Vendor indicates compliance
CRS Warehouse - COB Extracts	Y		
CRS Warehouse - Medstar	Y		Replace
CRS Warehouse - Redbrick	Y		Vendor indicates compliance
Disophone - Cognis Decision, Enterprise Voice	Y		Vendor indicates compliance
Disophone - Enterprise Text	Y		Vendor indicates compliance
ORIG Groupset	Y		Replace/Obsolete
First Coast - Accounts Payable	Y		Replace - by the Year 2000
First Coast - ADT	Y		Replace - by the Year 2000
First Coast - Fixed Assets	Y		Replace/Obsolete
First Coast - General Ledger	Y		Replace/Obsolete
First Coast - Materials Management	Y		Replace - by the Year 2000
First Coast - Medical Records	Y		Replace - by the Year 2000
First Coast - Order Communications	Y		Replace/Obsolete
First Coast - Patient Accounting	Y		Replace - by the Year 2000
First Coast - Payroll/Timekeeping	Y		Replace - by the Year 2000
First Coast - System Management	Y		Replace - ORSOS
First Coast - Work/Welfare, Work	Y		Replace/Obsolete
Global - Accounts Payable	Y		Vendor Upgrade - Suite 2000, available 3/8/1998
Global - Fixed Assets	N		Vendor Upgrade - Suite 2000, available 3/8/1998
Global - General Ledger	N		Vendor Upgrade - Suite 2000, available 3/8/1998
Global - Global Link (GLI)	N		Upgrade to Version 1.0 - currently available
Global - Global View Report Writer	N		Vendor Upgrade - Suite 2000, available 3/8/1998
Global - Materials Management	N		Vendor Upgrade - Suite 2000, available 3/8/1998
HIS - Accounts Receivable	Y		Replace - by the year 2000
HIS - Address Label System	Y		Replace - Under Analysis
HIS - Admitting	Y		Replace - CX
HIS - Admitting	Y		Unknown
HIS - Charge Functions and History	Y		Unknown
HIS - Charge Entry System	Y		Replace - CX or Meditech
HIS - Common EDI (CEDI)	Y		Replace by 2000, when HISS goes away
HIS - Computer Billing (COBU)	Y		Replace by 2000, when HISS goes away
HIS - Department Patient Notes	Y		Replace - Meditech
HIS - Dietary	Y		Replace - Meditech
HIS - Discharge History	Y		Replace - by the year 2000
HIS - Discharge Summary	Y		Replace - Data Repository
HIS - Emergency Department Log	Y		Replace - CX
HIS - Event Booking	Y		Replace - under analysis
HIS - Financial Decision Support (Feed Forward)	Y		Replace - Preproject
HIS - Game	Y		Replace by 2000, when HISS goes away
HIS - Inpatient	Y		Replace by 2000, when HISS goes away
HIS - Lab Order Entry/Results Reporting	Y		Replace - Meditech
HIS - Location	Y		Integrate
HIS - Monitor	Y		Replace by 2000, when HISS goes away
HIS - Notebook	Y		Replace - under analysis
HIS - Nurse Appointment Scheduling	Y		Replace - CX
HIS - Nurse Control	Y		Replace - Meditech
HIS - Nursing Notes	Y		Replace - Meditech
HIS - Office Process/Procedures, (Work Processing)	Y		Replace
HIS - Operating Room Activity	Y		Replace - ORSOS
HIS - Order Communications (routing)	Y		Replace - Meditech
HIS - Patient Appointment Scheduling	Y		Replace/Obsoles
HIS - Patient Billing	Y		Replace - CX
HIS - Patient List Print Programs - Nursing	Y		Replace - Meditech
HIS - Payroll	Y		Replace - PeopleSoft
HIS - Pharmacy	Y		Replace - Meditech
HIS - Physician Patient List - Nursing	Y		Replace - Meditech
HIS - Problem Analysis and Recording	Y		Replace - under analysis
HIS - Program Inventory	Y		Replace by 2000, when HISS goes away
HIS - Radiology	Y		Replace - CX Radiology, Mid 1998
HIS - Remittance	Y		Replace by 2000
HIS - Report Writers	Y		Replace by 2000, when HISS goes away
HIS - Security/Program Inv.	Y		Replace by 2000, when HISS goes away
HIS - Surgical Preference List	Y		Replace - ORSOS, mid 1998
HIS - Tele Process Management (CPVT)	Y		Replace by 2000, when HISS goes away
HIS - Time/Attendance (Part of Payroll)	Y		Replace - One Staff/777
HIS - Travel Registry	Y		Replace - CRIS/EPAC
IX - AEM (Upgrade Tool), V. 8	N		Upgrade to New Release - Version 8.4 in 1998
IX - Billing/Accounts Receivable, V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - Chart Completion	N		Upgrade to New Release - Version 8.4 in 1998
IX - Chart Tracking, V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - Correspondence Log	N		Upgrade to New Release - Version 8.4 in 1998
IX - DEMS/Report Writer/ES, V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - EDI, V. 8	N		Upgrade to New Release - Version 8.4 in 1998
IX - Encoder Form Generator (EFG), V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - Encoders	N		Upgrade to New Release - Version 8.4 in 1998
IX - EPMS (linked to ADT/NPA Link)	N		Upgrade to New Release - Version 8.4 in 1998
IX - Hospital Patient Acc. (ADT/NPA Link), V. 8	N		Upgrade to New Release - Version 8.4 in 1998
IX - Inpatient	N		Upgrade to New Release - Version 8.4 in 1998
IX - Managed Care Systems, V. 8	N		Upgrade to New Release - Version 8.4 in 1998
IX - Patient Scheduling (SCHED)	N		Upgrade to New Release - Version 8.4 in 1998
IX - PCS (Paperless Coll.), V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - Radiology	N		Upgrade to New Release - Version 8.4 in 1998
IX - Reporting Module (Home grown)	N		Upgrade to New Release - Version 8.4 in 1998
IX - Security Plus, V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - Turnover Tool (TUS), V. 7	N		Upgrade to New Release - Version 8.4 in 1998
IX - User Mail	N		Replace - Data Repository
Medical Staff Info (Horizon)	Y		Upgrade to New Release, available January 1998
Meditech	Y		Vendor upgrade - Available mid 1998
OBScan 4	Y		Check midrange compliance
OBScan 4	Y		Unknown
ORIS	Y		Upgrade to new release, available June 1998
PAI Abstraction	Y		Replace - New App. to access CX
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
Phycor - CO Company (Utilization Review)	Y		Vendor - working on a release
Resource Scheduling (Fletcher-Allen system)	Y		Replace/Obsoles
Smart Mailer - Lettering	Y		Unknown
STX	Y		Vendor indicates compliance
VTMEDNET (Email)	Y		Replace - email package

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 for class discussion 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)."

What do you think of these instructions?

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

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!

Agenda

- ✓ In the News
- ✓ Midterm Exam Review
- ✓ Case Study 3 – A Hospital Catches the “Millennium Bug”