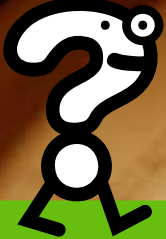


# *What Shall We Do With An Aging LIS?*



Hal Weiner  
President, Weiner Consulting Services, LLC



# Questions

1. Have an LIS and are happy?

2. Plan to replace your system?

3. Don't have an LIS?

4. Have LIS that needs help?

5. System is over 10 years old?



- **Driving Forces**

- **Internal**

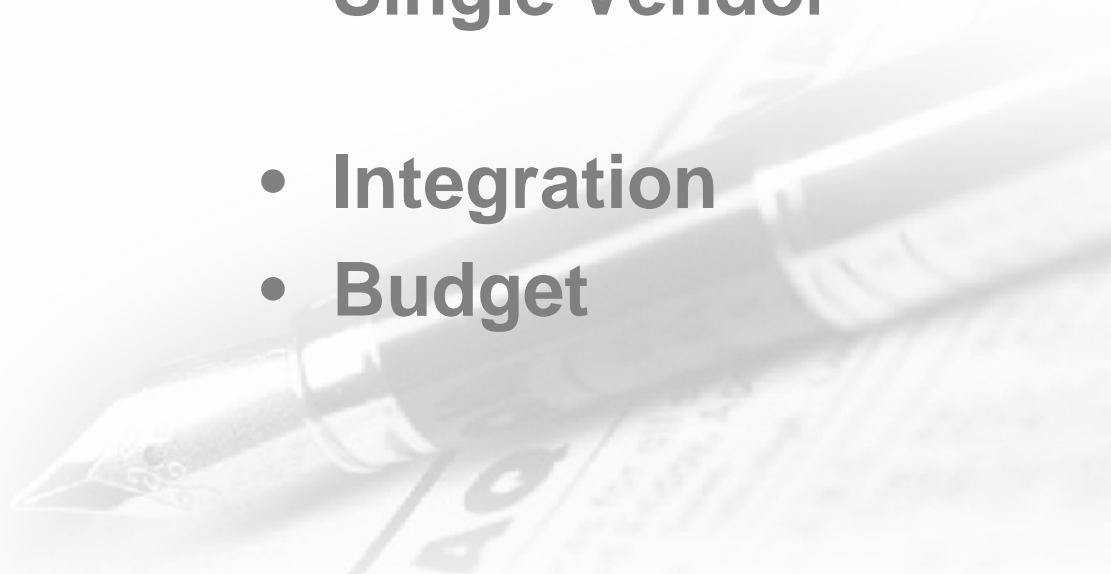
- IT Standards
- EMR
- Quality
- Productivity
- Performance

- **External**

- Market/Competition
- Regulatory
- Sunset/Support



# *Internal*

- **IT Standards**
    - **GUI**
    - **Database**
    - **Architecture**
    - **Hardware/OS**
    - **Single Vendor**
  - **EMR**
    - **Integration**
    - **Budget**
- 

A black and white photograph of two men in an office environment. The man on the left is wearing glasses and a white shirt, sitting at a desk with a computer monitor. The man on the right is also wearing a white shirt and is looking at a computer monitor. The background consists of cubicle walls. The text 'EMR' is overlaid in red on the man on the left, and 'LIS' is overlaid in blue on the man on the right.

**EMR**

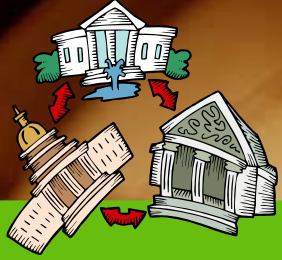
**LIS**



# *Internal*

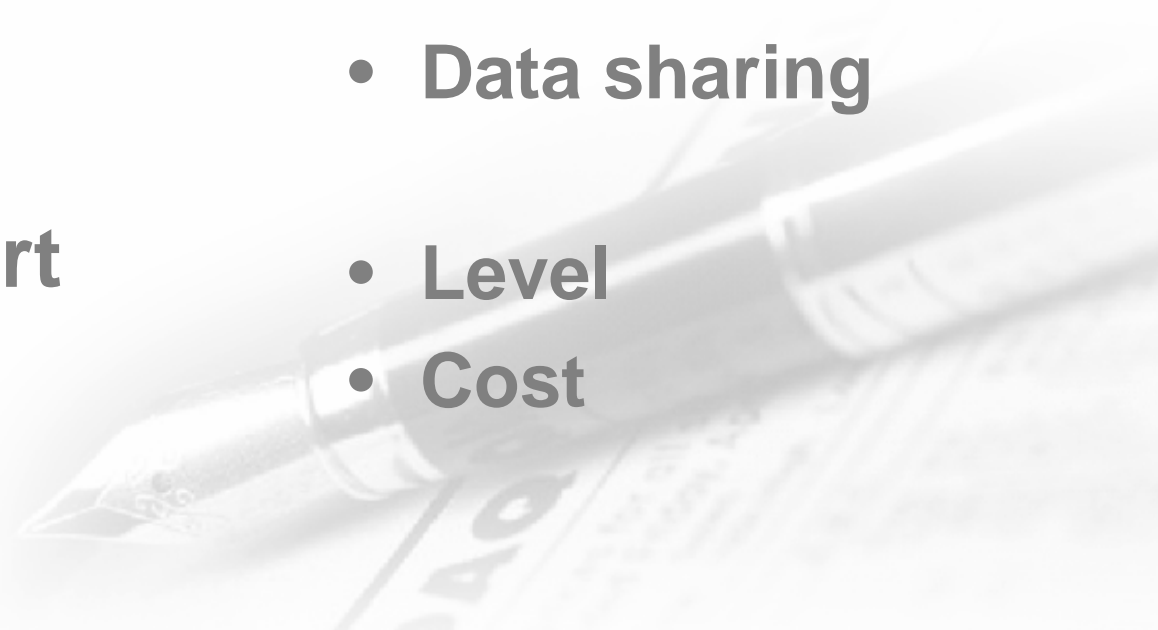
- **Quality**
  - Reduce Errors
  - QA
- **Productivity**
  - Ease of use
  - Automation
- **Performance**
  - Speed
  - Stability





# *External*

- **Market/Competition**
- **Regulatory**
- **Sunset/Support**
- **Outreach**
- **New products**
- **Rules**
- **Standards**
- **Data sharing**
- **Level**
- **Cost**





*What Can I Do??*





# Process



**PROJECT  
PLANS**

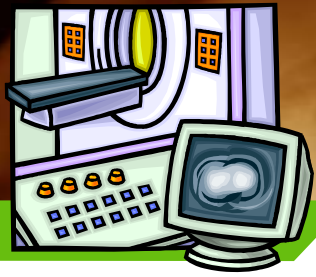




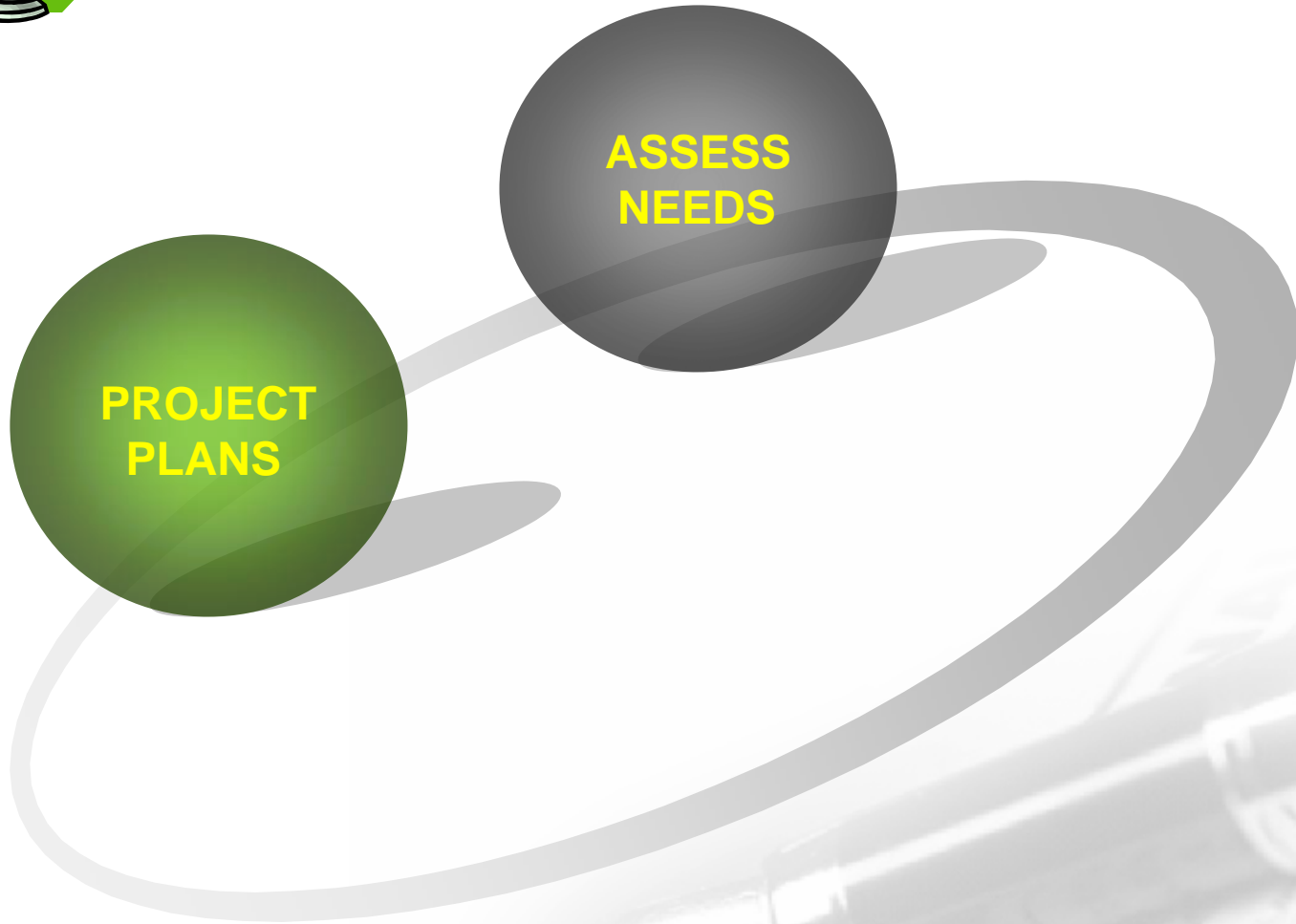
# Project Planning

ID		WBS	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1			1 Develop Team	2 wks	Tue 5/14/02	Mon 5/27/02		
2			2 Develop Project Goal	1 day	Mon 6/3/02	Mon 6/3/02		
3			<b>3 Weekly Status Meeting</b>	<b>241 days</b>	<b>Wed 6/12/02</b>	<b>Wed 5/14/03</b>		
53			<b>4 Analysis of current system</b>	<b>14 days</b>	<b>Tue 6/4/02</b>	<b>Fri 6/21/02</b>		
54		4.1	Chart workflow of systems	2 wks	Tue 6/4/02	Mon 6/17/02	2	
55		4.2	Create strength list of system	2 wks	Tue 6/4/02	Mon 6/17/02	2	
56		4.3	Create weakness list of system	2 wks	Tue 6/4/02	Mon 6/17/02	2	
57		4.4	Develop site statistics	1 day	Tue 6/18/02	Tue 6/18/02	56	
58		4.5	Chart changes to workflow	3 days	Wed 6/19/02	Fri 6/21/02	57	
59		<b>5</b>	<b>Document needs vs Benefits</b>	<b>10 days</b>	<b>Tue 6/18/02</b>	<b>Mon 7/1/02</b>		
60		5.1	Create basic needs	1 wk	Tue 6/18/02	Mon 6/24/02	56	
61		5.2	Create benefits	1 wk	Tue 6/18/02	Mon 6/24/02	56	
62		5.3	Match needs with benefits and work flow	1 wk	Tue 6/25/02	Mon 7/1/02	61	
63		6	Create a checklist & evaluation criteria	1 wk	Tue 7/2/02	Mon 7/8/02	59	
64		7	Submit checklist & evaluation for approval	1 wk	Tue 7/9/02	Mon 7/15/02	63	
65		8	Create inventory of current system	1 day	Tue 7/9/02	Tue 7/9/02	63	
66		<b>9</b>	<b>Create Evaluation Information</b>	<b>5 days</b>	<b>Tue 7/2/02</b>	<b>Mon 7/8/02</b>		
67		9.1	Create senerios	1 wk	Tue 7/2/02	Mon 7/8/02	59	
68		9.2	Create script	1 wk	Tue 7/2/02	Mon 7/8/02	59	
69		10	Evaluate potential vendors	2 days	Tue 7/9/02	Wed 7/10/02	68	





# Process



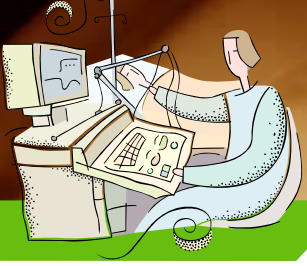
**PROJECT  
PLANS**

**ASSESS  
NEEDS**

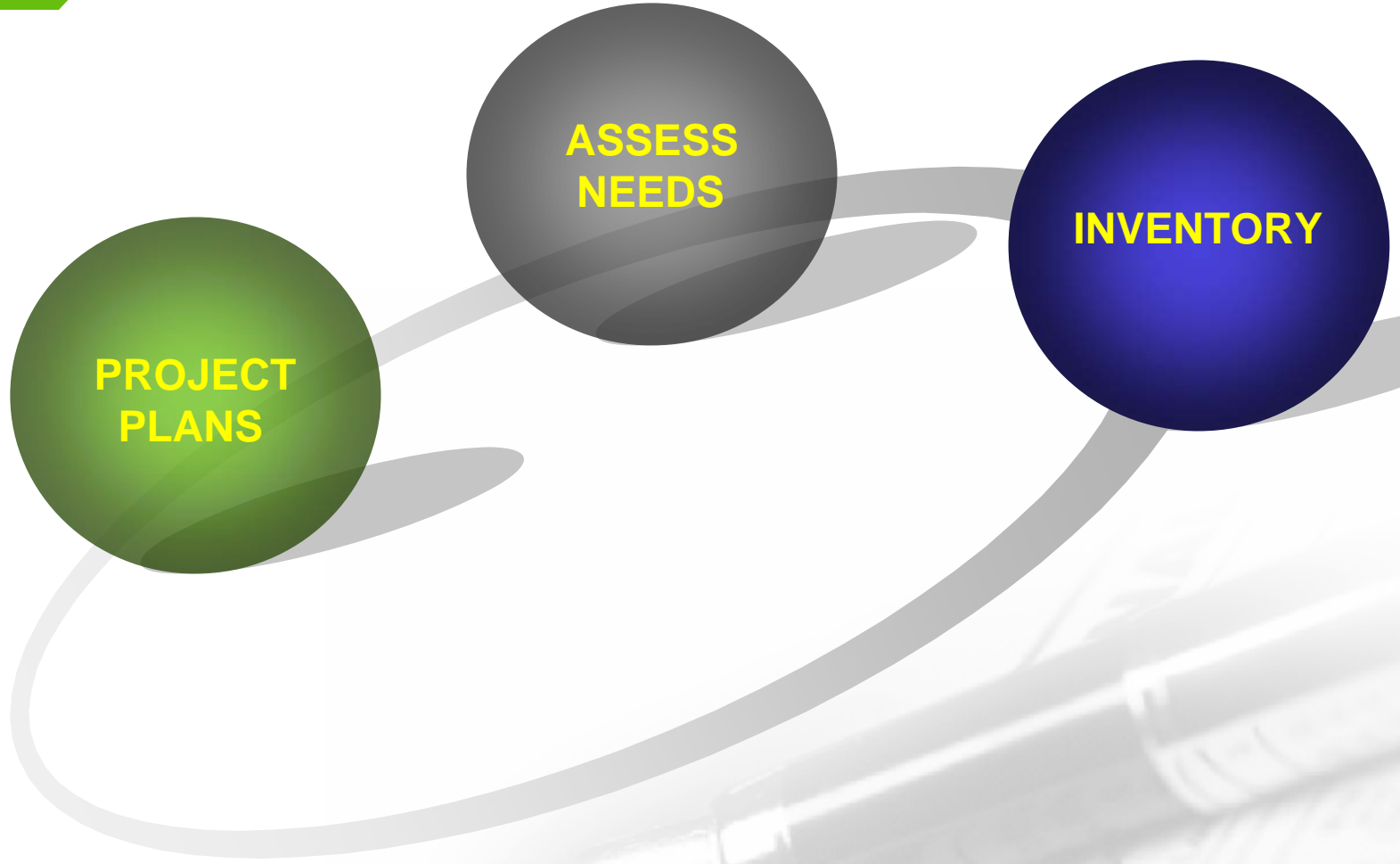


# Needs List

<b>Needs Checklist</b>			
		<b>Priority</b>	<b>Benefit</b>
1.000	<b>Pathologist Diagnosis</b>		
1.010	<b>1. Reduce TAT by 2 hours</b>	<b>1</b>	<b>Increase client satisfaction by 15%</b>
1.050	<b>2. Use of bar-code for dictation system</b>	<b>1</b>	<b>Remove need for handwriting labels</b>
1.060	<b>3. Use of voice entry by Pathologist</b>		<b>Reduce transcriptionist cost by 20%</b>
1.070	<b>a. Macros</b>	<b>2</b>	
1.080	<b>b. Continuous speech (batch and real-time)</b>	<b>1</b>	
1.090	<b>4. Image capture</b>		<b>Compete with Urocor</b>
1.100	<b>a. Simple capture process</b>	<b>1</b>	
1.110	<b>b. Assignment of images to case</b>	<b>1</b>	
1.120	<b>c. Annotation of images</b>	<b>2</b>	
1.130	<b>d. Image management system</b>	<b>3</b>	
1.140	<b>e. Network image storage</b>	<b>3</b>	
1.150	<b>5. Addition of diagrams</b>	<b>2</b>	<b>Compete with ABC lab</b>
1.160	<b>6. Creation of Partin Tables</b>	<b>3</b>	
1.170	<b>7. Calculation of Gleason Scores</b>	<b>4</b>	
1.180	<b>8. Use of synoptic reporting</b>	<b>2</b>	<b>Standardize reporting and autocode</b>
1.190	<b>9. Flag as interesting case or other</b>	<b>2</b>	<b>Provide easier report generation</b>



# Process



**PROJECT  
PLANS**

**ASSESS  
NEEDS**

**INVENTORY**



# Case Study #1

- Large teaching hospital
- Supported by local PhD and team
- Ran for 20 years with upgrades
- Hospital management bought new multi-site LIS
- Did not understand complexity of integration
- Turned into a year long fiasco
- Now operational





## Case Study #2

- Regional hybrid lab
- Pathologist modified commercial product to meet needs
- Pathologist retired
- Installed new system.
- Unable to implement all rules and functionality of older system.
- Billing are off and are losing clients
- Final outcome remains to be seen



# *Inventory*

- Work with your current vendor
  - “Hidden” features
    - Rules
    - Data extraction
    - Report generation
    - Screen customization
  - Current version upgrade
- Talk with your User Group
- Evaluate work-arounds







# Process



**PROJECT  
PLANS**

**ASSESS  
NEEDS**

**INVENTORY**

**REVIEW  
OPTIONS**



# SLAM's

- Quality Assurance/Quality Control
  - Compliance
  - Proficiency testing
  - Comparative QC
  - Documentation
  - Positive Patient ID
- Lab Portals
  - Centralized or de-centralized databases
  - Include Orders and Results



# *SLAM's (Con't)*

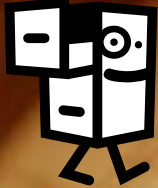
- Business/Productivity
  - Specimen management
  - Courier management
  - Client Services (CRM)
  - Scheduling
  - Business Management
  - Molecular/Consumer Directed
- Rules
  - Middleware/Standalone
  - Code vendors



# *Other Resources*

- Imaging
  - Image capture/ document management
- Consultants
  - Custom applications/Extend functionality
- Data extraction
  - Screen/report scraper
  - Data mining
  - Data conversion





# Sources

## File Connectors

- Access
- Access 97
- Access 2000
- Access XP
- Alpha Four
- ASCII (Delimited)
- ASCII (Delimited) Join
- ASCII (Fixed)
- Clarion
- Clipper
- CLF Webserver
- DataEase
- DataFlex
- DJ Log FileData
- dBASE II, III (III+)
- dBASE IV
- dBASE V (IDAPI)
- DIF
- Enable
- Excel
- Excel 2000
- Excel XP
- Folio Flat File
- Foxbase
- FoxPro
- LDIF
- Lotus 1-2-3
- Lotus Notes
- Lotus Notes 5
- Lotus Notes Structured Txt
- Lotus Works
- Mac ASCII Delimited
- Magic PC
- MAILERS+4 (dBASE)
- Microsoft Word (Mail Merge)
- Paradox (up to v5 only - IDAPI)
- Quattro Pro Windows v5
- Rich Text Format (RTF)
- Unicode (Delimited)
- Unicode (Fixed)
- WordPerfect 6.0 (Mail Merge)
- Wordstar (Mail Merge)
- WordPerfect 4.2/5.0
- Visual FoxPro
- Visual dBASE 5.5



# Targets

## Database Connectors

- ◆ Oracle 7.x
- ◆ Oracle 8.x
- ◆ Oracle 8.x Mul mode
- ◆ Oracle 9i
- ◆ Oracle 9i Mul mode
- ◆ Oracle 10g
- ◆ Oracle Direct Path
- ◆ Oracle SQL Loader
- ◆ Pervasive.SQL
- ◆ Pervasive.SQL v8
- ◆ Pervasive.SQL v8 Mul mode
- ◆ PostgreSQL
- ◆ PostgreSQL (ODBC 3.x)
- ◆ Btrieve v5
- ◆ Btrieve v6
- ◆ Btrieve v7
- ◆ Btrieve v8
- ◆ Btrieve v9
- ◆ CA dB-Fast
- ◆ C-ISAM
- ◆ Cloudscape
- ◆ CWM
- ◆ DB2 7.2 Univ. DB
- ◆ DB2 7.2 Univ. DB Mul mode
- ◆ DB2 Loader
- ◆ DB2 UDB Mass Insert
- ◆ DB2 (ODBC)
- ◆ DB2 Univ. DB
- ◆ DB2 Univ. DB Mul mode
- ◆ eXcelon
- ◆ eXcelon XIS 3.0
- ◆ Hitachi Hi-RDB
- ◆ IDAPI
- ◆ Informix DB Loader
- ◆ Informix (ODBC)
- ◆ Informix DB Loader
- ◆ Informix (ODBC)
- ◆ Informix Online DS
- ◆ Informix/SE Ingres (ODBC 3.x)
- ◆ Interbase (IDAPI)
- ◆ MUMPS (ODBC)
- ◆ MySQL
- ◆ NonStop SQL/MX
- ◆ ODBC 3.x
- ◆ ODBC 3.x Mass Insert
- ◆ ODBC 3.x Mul mode
- ◆ ODBC 3.5
- ◆ ODBC 3.5 Mul mode
- ◆ RBase 4.5 (ODBC)
- ◆ Red Brick
- ◆ Scalable SQL
- ◆ SQLBase
- ◆ Sybase 11.x
- ◆ Sybase 11.x Mass Insert
- ◆ Sybase 11.x Multimode
- ◆ Sybase 12.x
- ◆ Sybase 12.x Mass Insert
- ◆ Sybase 12.x Multimode
- ◆ Sybase BCP
- ◆ Sybase (ODBC)
- ◆ Sybase SQL Anywhere
- ◆ Sybase SQL Anywhere 6
- ◆ Sybase SQL Mass Insert
- ◆ Sybase SQL 11
- ◆ Sybase SQL 11 Mul mode
- ◆ SQL Script
- ◆ SQL Server 6.x
- ◆ SQL Server 7 Mass Insert
- ◆ SQL Server 7 (OLEDB) Multimode
- ◆ SQL Server 7 (OLEDB)
- ◆ SQL Server 2000
- ◆ SQL Server 2000 Mass Insert
- ◆ SQL Server 2000 Multimode
- ◆ SQL Server BCP
- ◆ SQL Server Mass Insert
- ◆ SQL Server (ODBC)
- ◆ Teradata (Fastload)
- ◆ Velocis (ODBC 3.x)
- ◆ Watcom SQL v5
- ◆ Watcom SQL (ODBC)





# Connectors

## B2B Connectors

- ◆ EDI (EDIFACT)
- ◆ EDI (X12)
- ◆ HCFA1500-NSF
- ◆ HIPAA
- ◆ HL7
- ◆ Text (Delimited - EDI)
- ◆ Text (Delimited - EDIFACT)
- ◆ Text (Delimited - HL7)
- ◆ TRADACOMS
- ◆ UB92-NSF

## Technology Connectors

- ◆ BizTalk XML
- ◆ Erwin
- ◆ FF Queue
- ◆ FTP
- ◆ HTTP
- ◆ HTML
- ◆ JMS
- ◆ LDAP
- ◆ MSMQ (Extractor)
- ◆ MSMQ (Fixed ASCII)
- ◆ MSMQ (XML)
- ◆ MQSeries (Extractor)
- ◆ MQSeries (Fixed ASCII)
- ◆ MQSeries (XML)
- ◆ SGML TCP/IP
- ◆ URL
- ◆ URI
- ◆ XML
- ◆ XML Schema
- ◆ XML DTD
- ◆ XML XDR



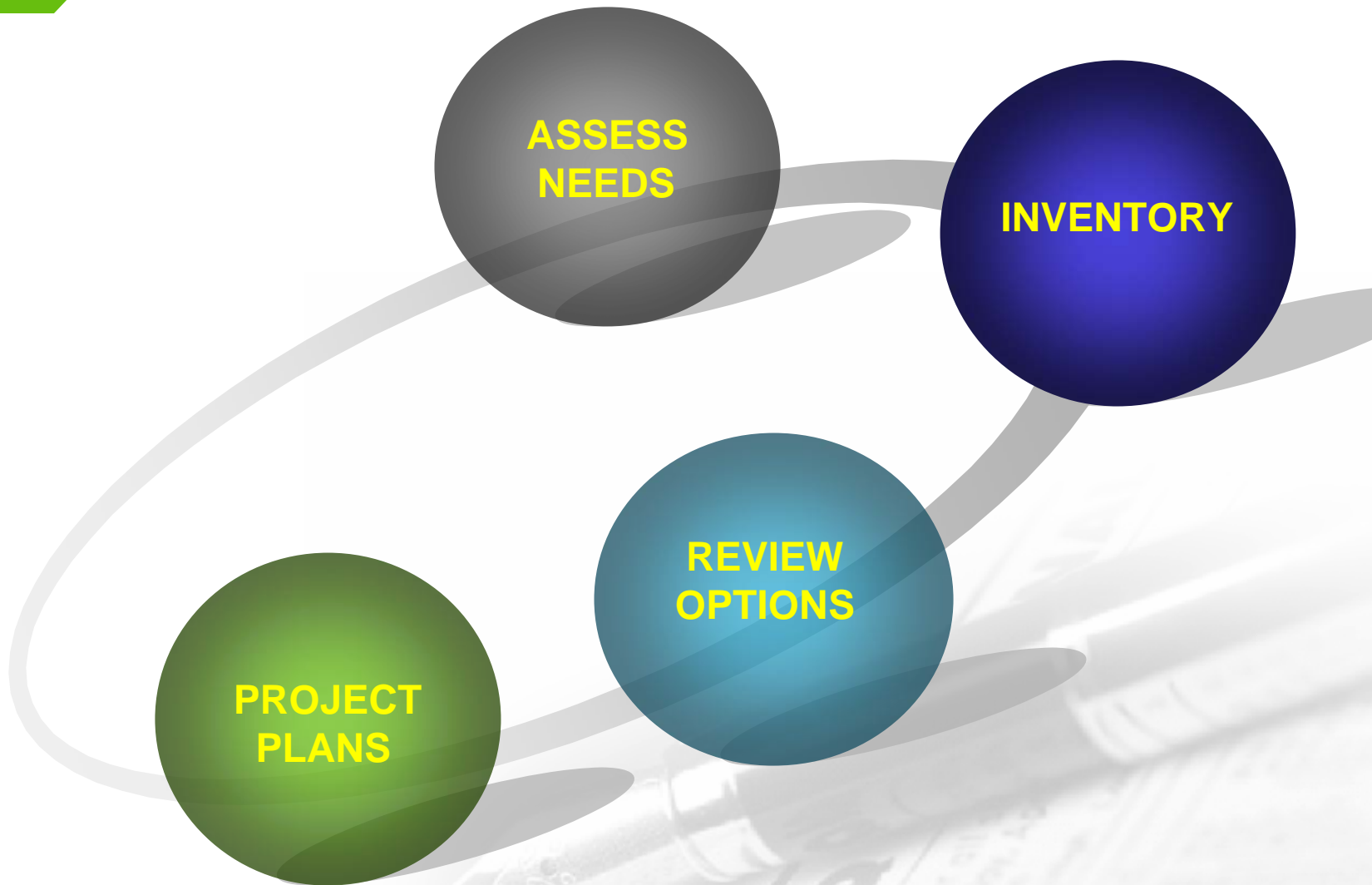
# *More Resources*

- Interfaces/Standards
  - Interface-less interfaces
  - LOINC/SNOMED
  - New transaction modalities
  - Many standards groups
- Hardware replacement alternatives
  - Used Equipment Brokers/Hosting





# Process



**ASSESS  
NEEDS**

**INVENTORY**

**REVIEW  
OPTIONS**

**PROJECT  
PLANS**



# *Hal's Laws*

The Job Always Takes More Time Than It Takes!!

The First 90% Of A Project Take 90% Of The Effort ...

The Next 10% Also Takes 90% Of The Effort!!

A Consultants Recommendation Is A Systematic Method Of Sometimes Coming To The Wrong Conclusion With Confidence!



# Project Planning

ID	ACTION	Responsibility	Duration
105	<b>Phase IV - User Training, Validation and Data Conversion</b>		<b>68 days</b>
106	<b>End User Training Activities</b>		<b>31 days</b>
107	Client completes end user training/policy manuals	Client Project Manager	5 days
108	Client creates competency measurement plan	Client Project Manager	2 days
109	Client trains end users	Client Project Team[27%]	15 days
110	End user competency measurement	Client Project Team	1 day
111	<b>Validation Activities</b>		<b>50 days</b>
112	Create and Load Test Case Data	Client Project Team	5 days
113	Client Implementation Team validates system	Client Project Team[38%]	40 days
114	Validation review	Client Project Team[20%]	5 days
115	<b>Pre-live Assesment</b>		<b>1 day</b>
116	Create "go live" task list	Client Project Manager[50%]	4 hrs
117	Review "go live" task list	Client Project Manager, Vendor Project Manager	4 hrs
118	<b>Production Database Activities</b>		<b>3 days</b>
119	Initialize Production Database	Vendor Systems[13%], Client IS[50%]	1 day
120	Load Production Tables	Client IS[25%]	1 day
121	Final Data Conversion to Production	Client IS	1 day
122	<b>Parallel Testing Activities</b>		<b>12 days</b>
123	Create Parallel Test Plan	Client Project Manager[50%]	1 day
124	Execute Parallel Test Plan	Client Project Team[400%]	1 day
125	Review and Sign-off Parallel Test Activities	Client Project Team	1 day





## *Do I Keep It??*

- Still works and meets business needs
- Acceptable performance/reliability
- Good hardware support/growth
- OS/database migration path
- Cost of replacement too high
- Replacement systems not much better
- Vendor support adequate and will continue
- In-House staff can support if necessary
- SLAM's can fill "gaps"
- Conversion is too risky



# RIP???

- Vendor going “out-of-business” or no support
- Unacceptable performance
- Cannot support changing business needs
- No hardware support
- Low system reliability
- No migration path for hardware/software
- Technology outmoded
- Inadequate capacity for growth
- Cost of replacement within budget
- Well proven replacement systems exist
- Proven track record for smooth implementations

# *So, What Do You Do With??*





# Questions

**THANK YOU**

