

Minimum Cost Web Based System  
Development and Implementation: Realizing  
the Vision of Decision Support 2000+ and  
Meeting HIPAA Requirements

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# Overview

Key stakeholders must overcome significant challenges to realize HIPAA requirements and benefit from integration of Decision Support 2000+ and MHSIP standards. The Community Mental Health Center (CMHC) is a primary collection point for data associated with Mental Health Services. The Center for Life Management (CLM), a New Hampshire CMHC, has successfully met these challenges by applying affordable technology and business solutions. Essential factors included: organizational commitment, development targets driven by strategic objectives, and active stakeholder participation. CLM has experienced sustained progress towards strategic objectives, improved data validity, reliability, and generation of value from collected data.

# Challenges: Accept Realities, Manage Possibilities

Realities: Increased Demands and Decreased Resources

- Demands: Essential Requirements of Doing Business
  - ◆ Increased Regulatory and Payer Requirements
    - Federal, State, Industry and Insurance
  - ◆ Increased Expectation to Demonstrate Efficacy
    - Objective Measurement and Reporting
  
- Possibilities: Application of Knowledge, Resources and Tools
  - ◆ Application of Private Sector Business Knowledge
    - Process and Workflow Re-engineering
  - ◆ Application of Current Information Technology
    - Knowledge, Skills, Tools and Resources

# Involved Organizations

- NH Department of Health and Human Services (DHHS)  
Department of Behavioral Health (DBH)  
<http://www.dhhs.state.nh.us/DHHS/DBH/default.htm>
- NH – Dartmouth Psychiatric Research Center  
<http://www.dartmouth.edu>
- Common Ground Softworks  
<http://www.qilan.com>
- Center for Life Management (CLM)  
<http://www.centerforlifemanagement.org>

## CLM Physical Characteristics

- 5 Primary Agency Locations
- Outsourced Offsite Services (e.g. Transcription)
- Locations and Outsourced Services Use  
Combination of Intranet and Internet Connectivity
- 4 Server Operating Systems
- 6 Primary Database Applications
- 100+ System Users
- 2 Primary User Platforms Mac/PC
- Average Hardware Age 5 Years

## CLM Strategic Objectives → I.S. Objectives

### CLM Strategic Objectives

- Improve Fiscal Health
- Regulatory Compliance
- Improve Services
- Improve Community Awareness/Outreach
- Improve Infrastructure
- Improve Staffing and Staff Competencies
- Improve Integration and Coordination with Community Providers

### Related I.S. Objectives

- Minimize Costs
- Comply with Regulations
- Eliminate Redundancy
- Improve Data Quality
- Automate Workflow
- Improve Provided Service
- Increase Scope of Services
- Improve Training
- Real Time Reporting
- Pervasive Movement to Electronic Records

## Realizing the Vision: Essential Elements

- Commitment throughout the organizational structure: Board of Directors, Senior Management, Management, Line Staff
- Knowledge and skills within the organization or acquired through outsourcing: Objectivity, Communication, Flexibility and Role Expertise
- Resources: Staff, Energy, Funding and Time

Thinking outside the box - Re-distribute Information Services FTE hours, to part-time line staff IS Liaison positions. This increased stakeholder involvement and facilitated development and implementation of the information system.

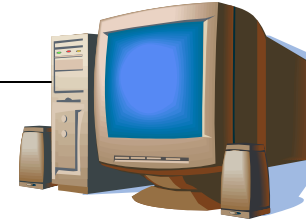
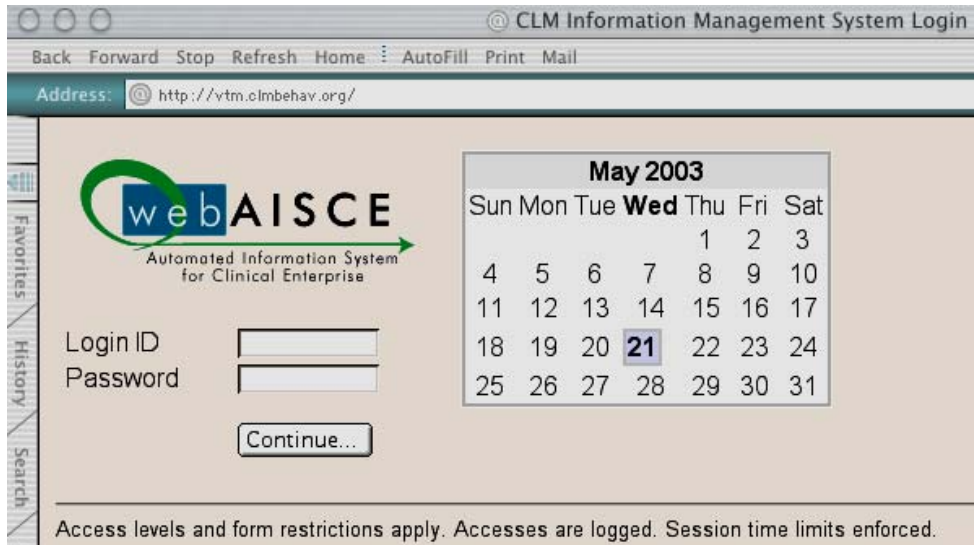
## Realizing the Vision: Development and Implementation

1. Specification of Global Requirements
2. Assessment of Existing Resources and Processes
3. Identification of Required Resources.
4. Identification of Required Process Modifications
5. Establishing Priorities
6. Initiating Efforts
7. Maintaining Momentum

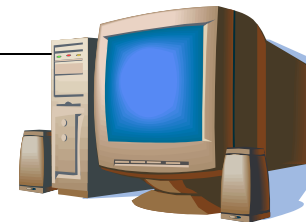
## Development and Implementation: Global Requirements

1. Integrate Existing Systems, Create Standard User Experience
2. Minimize Hardware, Software and Development Costs
3. Automate Processes to Decrease Demands on User
4. Integrate Current and Anticipated Best Practices and Assessment Requirements (e.g. MHSIP/Decision Support 2000+)
5. Improve Communications: Stakeholders Information Access (staff, consumers, payers, community)
6. Improve Service Coordination: Community Partners Information Exchange (e.g. medical providers)
7. Validate Data On Entry, Provide Immediate Feedback to User, Prevent the Entry of Errors
8. Integrated Training Resources (System and Process)
9. Use Data as it is Collected to Assist the Reporter and Collector

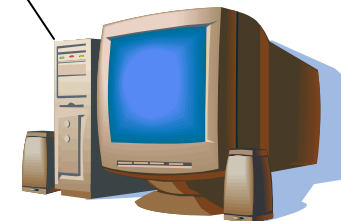
# Development and Implementation: Global Requirements: Integration and Creation of Standard User Experience



NT Server:  
Proprietary  
Child Services  
Clinical  
Application  
Running Access  
Database.

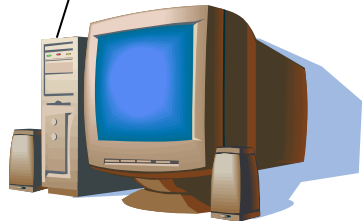


Windows 98  
Server: Custom  
Mailing  
Application  
Developed with  
Filemaker Pro.

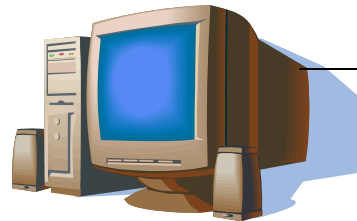


AIX Server: Primary Legacy System,  
Running Proprietary AR Software that  
Connects to an Informix Database.

Lines Represent User Experience Being Independent of the Data Source. All Data Served Passes Through Web Server and is processed by Qilan Application. Experience is also independent of User OS (PC/Mac).



OS X Server: Primary  
Agency System With  
Openbase SQL Database.



Mac OS9 Server: Clinical and  
Billing Application for Adult  
CSS Developed with Helix.

## Development and Implementation: Global Requirements: Minimize Hardware, Software and Development Costs

	Selected		Comparison	
Database Application	OpenBase (unlimited)	2000.00	MS SQL Server	10000.00
Software Applications	Qilan (unlimited)	1000.00	MS Web Suite	10000.00
Server	OS X Server (unlimited)	5000.00	PC Server	5000.00
Total		8000.00		25000.00

There are many important factors to evaluate when investing in information services. Cost is one of these factors. The example above is provided to demonstrate project cost savings associated with selections made. Comparisons made with Unix based systems were directionally consistent and more pronounced. Development costs trends were consistent with those displayed. The displayed table is a significant oversimplification.

# Development and Implementation: Global Requirements: Automate Processes to Decrease Demands on Users

Assessments Based On Period Ending on the Last Day of **1/2003**

Paperwork Being Completed During **2/2003**

C# ID	Consumer Name	Admit Date	Assmts Done	Assmts Undone
100201	Testadultlast, Testadultfirst Testadultmiddle	01/24/2002	4 <a href="#">Substance and Medication Use or Abuse</a> <a href="#">Self Management of Treatment</a> <a href="#">Residential</a> <a href="#">Vocational and Educational Activity</a>	10 <a href="#">Symptom Elevated Mood/Mania</a> 10/01/02 <a href="#">Symptom Depression</a> 10/01/02 <a href="#">Symptom Suicide</a> 10/01/02 <a href="#">Symptom Anxiety</a> 10/01/02 <a href="#">Symptom Psychosis</a> 10/01/02 <a href="#">Activities of Daily Living</a> 10/01/02 <a href="#">Interpersonal Relations</a> 10/01/02 <a href="#">Adaptation to Change</a> 10/01/02 <a href="#">Concentration, Task Performance and Pace</a> 10/01/02 <a href="#">Community Supports</a> 10/01/02 <a href="#">Global Assessment of Functioning</a> 10/01/02 <a href="#">Naturopathic Screening (Adult)</a> <a href="#">Hostile, Dangerous and Problem Behaviors</a> 10/01/02 <a href="#">General Health and Medical Comorbidity</a> 10/01/02

Automation of processes involves determining what elements of the business process are rule based and automating those processes, A simple example is due dates for assessments. The due dates are rule based, therefore, the user should not need to track dates things are due, the system should present things due to the user to be completed. Reports should not be static, they should be interactive and assist the user in completing their work. The displayed report links the user to work to be completed.

# Development and Implementation: Global Requirements: Ability To Integrate Current and Anticipated Assessments

**Use this form to enter/edit scale information at it relates to clinical scales.**

Select Scale

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**Selected Scale: General Health and Medical Comorbidity**

[Interventions](#)

Applied

**Header Text**

Max 1023 characters

**Threshold (0A-0Z)** Greater than  Less than  Equal to

**Threshold (11-99)** Greater than  Less than  Equal to

**MHSIP**  (check if this scale is required by MHSIP)

->  <- Check to Update Scale

---

**Reference**  Completed...

->  <- Check to Create or Update

Entry and modification of the assessments and how the assessments relate to other aspects of the system should be soft coded. Soft coding allows the additions and any necessary changes to be made by staff with clinical expertise without the need for any application modifications or developer involvement. \* Only part of the entry/modification form displayed.

# Development and Implementation: Global Requirements: Validate Data On Entry, Provide Immediate User Feedback

**General Health and Medical Comorbidity** [Print](#)

Do you have a medical doctor?	<input type="text"/>	1-3	Has all significant need for glasses or tx of eye disease been met?	<input type="text"/>	1-3
Have you had a checkup with a medical doctor or nurse in the last 3 months?	<input type="text" value="4"/>	1-3	Has all significant need for a hearing aide been met?	<input type="text"/>	1-3
Have you had a checkup with a dentist in the last 3 months?	<input type="text"/>	1-3	Has all significant need for medical tx (other than dental, eye, hearing) been met?	<input type="text" value="0"/>	1-3
Are all your dental problems being corrected?	<input type="text"/>	1-3	If the consumer has needs, why? (See codes)	<input type="text"/>	1-7
<b>Number of prescribed non-psychiatric medications taken daily?</b>	<input type="text" value="101"/>	0-100	Do any other medical problems affect daily function?	<input type="text"/>	1-7
<b>Summary Rating of Health Status</b>	<input type="text" value="1"/>	1-5	<b>Area of Service Planning</b>	<input type="text" value="0"/>	0-1

Comments/Observations

ABOVE IS AN EXAMPLE OF MULTIPLE ENTRY ERRORS - THE USER IS NOTIFIED ON THE ATTEMPT TO ENTER TO ASSIST TRAINING, ENTRY IS INCOMPLETE UNTIL CORRECTED!

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**Validation Check...** UNSUCCESSFUL. Please review all cells highlighted in red. An entry is missing (when required) or a value has been entered outside of the acceptable ranges or, if the assessment includes MHSIP scales, a data inconsistency error was detected. YOUR ASSESSMENT HAS NOT BEEN FORMALLY SAVED. A temporary record of your entries was stored and will be retrieved the next time you re-visit this consumer for the same month/year. It is strongly suggested, however, that you correct your invalid entries now and re-save this form before leaving.

Validation on entry and immediate user feedback facilitates training and will increase data validity and reliability. Preventing the posting of data errors has significant implications for data reporting and subsequent dependent activities.

# Development and Implementation: Global Requirements: Integrate Training Resources (System and Process)

## Selecting an Eligible Intervention:

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A third section will appear in the form displaying the concern you selected and a select menu will appear to the right of "Eligible Interventions".

<b>Selected Target</b> Eligible Interventions	<b>Activities of Daily Living</b> 102 - Functional Assessment	New Item
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Tip: Only items that have been approved as appropriate interventions for the identified concerns will be displayed in the drop down menu.

From the list highlight the intervention that will assist the consumer with resolving the concern, then single click on the button labeled **Select**'.

<b>Selected Target</b> Eligible Interventions	<b>Activities of Daily Living</b> 603 - MIMS Individual Psychotherapeutic Intervention	New Item
--	---	----------

Training resources and user help are available from the form the entry is occurring on. The example above is taken from the file that displays if the user clicks on help for selecting eligible interventions while they are entering a treatment plan. Other information directly accessed by the application includes process documentation associated with the form the user is in: who is responsible for what when. Help files are administratively defined and entered, no programming modifications are required.

## Realizing the Vision: Outcomes

- Functionality in CLM Information Systems consistent with those of million dollar systems at costs consistent with those of a standard industry vendor system purchase
- Significant progress towards CLM strategic objectives
- Optimized processes
- Cross department team building: agency wide collaborative efforts, improved communication and understanding
- Staff investment in working with information resources and services

# Summary

The Center for Life Management (CLM) has successfully overcome numerous regulatory, environmental, operational and reporting challenges by applying affordable technology solutions and business knowledge, to improve processes and practices. Essential factors included: commitment at all levels of the organization, development targets derived from strategic objectives, and a primary focus on active stakeholder participation. In addition to sustained progress towards strategic objectives, CLM has experienced improved data validity, reliability and generation of value from collected data.

# Useful Resources and References

Completed application information [www.webaisce.com](http://www.webaisce.com)

Software Tools and Application Information

Cost Effective SQL Database Application

<http://www.openbase.com>

Cost Effective Web Application Development and Integration Tools

<http://www.qilan.com>

Example of Point Application (Accounts Payable)

<http://www.fundware.com/>

Information on Decision Support 2000+ and MHSIP

<http://www.mhsip.org/>

Some Recommended Readings Available On the Internet:

Darwin Executive Guides. intranet/extranet. November 8, 2002

<http://www.guide.darwinmag.com/technology/web/intranet/index.html>

CIO Executive Summaries. Enterprise Application Integration. September 16, 2002

<http://www.cio.com/summaries/enterprise/integration/>

Marco Iansiti, Integration. The Right Way, the Wrong Way. CIO Magazine May 15, 2003.

[http://www.cio.com/archive/021503/erp\\_content.html](http://www.cio.com/archive/021503/erp_content.html)

Steve Burbeck, Ph.D, The Tao of e-Business Services. The evolution of Web applications into service-oriented components with Web services. October 1, 2000

<http://www-106.ibm.com/developerworks/webservices/library/ws-tao/?dwzone=webservices>

Margie S. Virdell, Business processes and workflow in the Web services world. January 1, 2003

<http://www-106.ibm.com/developerworks/webservices/library/ws-work.html>

Scott W. Ambler, Active stakeholder participation. Why you need it. May 1, 2001.

<http://www-106.ibm.com/developerworks/webservices/library/co-tipstk.html>

Dietmar Kuebler and Wolfgang Eibach, Adapting legacy applications as Web services. January 1, 2002

<http://www-106.ibm.com/developerworks/webservices/library/ws-legacy/>

Stephanie Overby, This could be the start of something small. CIO Magazine February 15, 2003.

[http://www.cio.com/archive/021503/erp\\_content.html](http://www.cio.com/archive/021503/erp_content.html)