Texas
Department of State Health Services
♦
Mental Health
&
Substance Abuse Services
Division
§
Clinical Management For
Behavioral Health Services
(CMBHS)
♦
Beta Pilot Test Results Report

Table of Contents

I. Executive Summary

Overview

The Clinical Management for Behavioral Health Services-Beta (CMBHS-BETA**) is the test version of the Department of State Health Services (DSHS), Mental Health and Substance Abuse Services (MHSAS) division's locally-developed web-based electronic health record (EHR) application designed to be used by DSHS contract community mental health (MH) and substance abuse (SA) service providers.** The purpose of the beta pilot was to evaluate the software's functionality, user interface, training and support systems during a time-limited deployment in community SA and MH active clinical environments. The beta pilot also provided an opportunity to examine software release management and deployment processes in preparation for a scheduled production release deployment in calendar year 2009.

The scope of the pilot required three (3) or more users at each of seven (7) DSHS community MH and SA contract provider pilot sites to use CMBHS as their health record to enter "admission to discharge" client data for at least twenty (20) clients per site during a one-hundred fifty day (150) day period from January 14th, 2008 to June 15th, 2008. The planned CMBHS "Data Exchange" feature, however, was not a test component of the pilot.

Training and Support

Two CMBHS-BETA user training sessions were provided by the Behavioral Health Integrated Provider System (BHIPS) and CMBHS Training and Technical Assistance (TT&A) Team for prospective pilot site users in Austin at outset of the pilot. They were the January 8th & 9th, 2008, "Hands-on User Training" for pilot user participants and a January 24th, 2008, "Overview/Read-only Training" for MHSAS NorthSTAR staff. Hands-On training received the seventh (7th) highest overall satisfaction rating on the software, training, rollout and support (STRS) satisfaction evaluation. However, the seventh (7th) place ranking appears to be the result of one user's particularly low score. It appears as if this user did not attend training, yet scored the STRS training item nonetheless. If this score is factored out of the overall satisfaction rank, the CMBHS-BETA training function would rank fourth (4th) in overall satisfaction.

Throughout the pilot, users received software support from the BHIPS/CMBHS TT&A Team. The BHIPS/CMBHS TT&A Team were employed in a dual capacity to provide training and support for BHIPS and CMBHS-BETA users during the pilot. The CMBHS-BETA Pilot Help Desk (HD), like the BHIPS HD, is a pager-based system available to users Monday through Friday, 8 AM to 5 PM, except State and Federal Holidays. The CMBHS telephone support system received the second (2nd) highest overall satisfaction ranking on the software, training, rollout and support (STRS) evaluation.

Communication and End-User Requirements

In an effort to facilitate communication between CMBHS-BETA designers, developers and users, a series of one-hour teleconferences were held throughout the pilot timeframe. During the twenty-two (22) week period of the pilot (January 14 to June 15, 2008) fourteen (14) teleconferences were conducted. The teleconferences created a live interaction and feedback session between users and the design and development teams.

As a result of the teleconferences, one hundred thirteen (113) issues were brought to the table as "agenda items". These issues were subsequently vetted by the CMBHS Focus Group to identify duplicates, user errors and system "bugs". Many of these remaining issues were classified as "change requests" and put in queue for implementation as priority and funding allow. However, throughout the pilot, the CMBHS design and development teams took swift action with a number of the suggestions submitted, especially "bugs". Because these changes improved functionality or corrected a problem, these were approved quickly and incorporated into "beta release upgrades" distributed during the pilot. There were four beta release upgrades with a total of thirty-four (34) change requests implemented.

The teleconferences received the highest satisfaction ranking on the STRS evaluation.

Satisfaction with the CMBHS-BETA Product

Overall, pilot users seem satisfied with CMBHS-BETA. It contained all the major components of an electronic health record and most users found it relatively easy to use. It was apparent that SA users found CMBHS-BETA easier to user due to its similarity to BHIPS. As previously mentioned, over a hundred user-generated suggestions are being considered for CMBHS production release implementation and improvement.

A concern about how CMBHS can be reconciled with local workflow processes emerged as a major concern toward the conclusion of the pilot. To that end a workflow review meeting is planned for this fall. CMBHS-β pilot users will be invited to review CMBHS with the design and development teams and make suggestions that will align CMBHS with the natural workflow.

Hardware Performance: Servers and Workstations

Server Availability

Another function of the pilot was to assess the availability, reliability and efficiency of the information technology architecture and devices that run the application. During the one-hundred-fifty (150) day pilot, the CMBHS-BETA server was available 98.57% of the time. When compared to the 99.9% EHR industry availability standard, CMBHS-BETA was not available to pilot users for a total period of 48 hours during the course of the pilot or 115.2 hours annually. Consider the cost of lost productivity from even this seemingly small amount of unavailability. First, multiply the 115.2 hours a year by the number of MH and SA professionals who would not be able to complete their clinical work due to the unavailability of the medical record, and then multiply that by their hourly rate. It quickly adds up to a large expense. As an example, if only a hundred (100) MH and SA professionals (physicians, nurses, psychologists, social workers, therapists, etc.) statewide are only able to access CMBHS at an availability rate of 98.57%, the annualized cost in lost work and the subsequent re-work would be well over one million dollars ($1,000,000).

Improved server availability should be a priority for the statewide CMBHS production release

Workstation Function

There were no reports of users attempting to run CMBHS-BETA on workstations below the minimum specification. However, several users operating spec notebook computers did experience performance problems. During the CMBHS-BETA pilot several notebook users reported performance problems related to "AirCards". AirCards allow field staff to access CMBHS-BETA on the Internet via wireless cell phone networks when away from the office and especially in rural locations. Apparently AirCard

transmission rates are below those of conventional cable transmission thus compromising CMBHS performance. Additionally, like with cell phones, users encountered "dead zones" where they would either lose reception or be unable to achieve connectivity at all. In some instances, these issues were resolved locally by making changes to the notebook setup or changing service provider, but all in all, AirCard technology simply will not match the connectivity capability of cable.

Shut Down Activities

As mentioned previously, the CMBHS-BETA pilot officially concluded on June 15, 2008. However, to complete data entry at target levels, authorized users were granted CMBHS-BETA access an additional two (2) weeks through June 30, 2008. CMBHS-BETA was also available to users to complete the online STRS Evaluation. CMBHS-BETA was officially shut down on July 3, 2008, with pilot site user access discontinued.

Following the close of the pilot, all pilot client data remains secure. It is being studied and reviewed by authorized CMBHS-BETA project personnel. As stated in the pilot sites "Beta Test Agreement", when the data is no longer required, it will be destroyed or returned to the individual pilot sites.

Satisfaction Survey

The software, training, rollout and support (STRS) User Satisfaction Evaluation is an online instrument developed to measure the satisfaction level of our CMBHS-BETA pilot users with respect to the following four (4) major components of the CMBHS-BETA Pilot: the software application itself, user training, rollout or deployment of the new system and user support during the pilot.

Eleven (11) or 33% of thirty-four (34) CMBHS-BETA users completed the STRS evaluation. This is above the expected 25% return rate for surveys. Nonetheless, with such small numbers, the data must be considered and used cautiously. The STRS yielded an "All Users Overall Satisfaction Level" of "Satisfied" with a rating of 77.49% out of a possible 100. The "SA Users Overall Satisfaction level" was "Satisfied" with a rating of 77.22% out of a possible 100. The "MH Users Overall Satisfaction Level" was "< Satisfied" with a rating of 74.89% out of 100.

Lessons Learned

At the conclusion of the pilot, the CMBHS design and development team members were asked to submit lists of "lessons learned" from the pilot and things that could have been done better differently. Not every member of the teams responded to the request. The comments are purely subjective and were not edited for content. The comments fell into four general categories. They are communication, workgroups, training and pilot sites. A few of the major ones are listed here.

- There's a need for better internal communication, especially between IT and non-IT staff.
- Design workgroups, such as the "focus group", would function more effectively and efficiently with full-time staff instead of assigning staff who already have a full-time job to do two jobs.
- The online help needs to be clear and concise.
- Software screens must be tested thoroughly before release.
- Pilot site executive directors volunteered staff for the pilot without providing additional help to complete their regular job and the new pilot duties.
- The workflow review meeting should have occurred much earlier in the pilot.

A complete repeort on the pilot follows this executive summary in addition to supporting documents in the Appendix.

II. Acknowledgements

The CMBHS-BETA Pilot project required the concerted effort of several groups of people. The pilot was designed to test the CMBHS-BETA software application itself in addition to the training, rollout and user support processes necessary to implement and support a newly-developed shared application. The Texas Department of State Health Services (DSHS) Mental Health and Substance Abuse Services (MHSA) Division is extremely grateful to the groups and individuals listed below for their commitment to the success of the beta pilot. Each member of the groups listed below contributed to the success of the CMBHS-BETA pilot by sharing their knowledge, experience and resources. DSHS is especially grateful for the many hours of data entry required of each pilot user to ensure a thorough test of CMBHS-BETA.

A. CMBHS-BETA Pilot Sites

Seven (7) pilot sites were selected to participate in the one hundred fifty (150) day pilot. (The original ninety day pilot was extended by another sixty days to ensure adequate data collection and system testing.) Pilot sites were selected to represent the target CMBHS user population. The target user population was all DSHS contract providers of community mental health and substance abuse services including the NorthSTAR initiative. Of the seven pilot sites, three are providers of community substance abuse services. The remaining four provide community mental health services and some substance abuse services. Each pilot site provided between two (2) and eight (8) CMBHS-BETA users/testers for a total of thirty-four (34). The thirty-four (34) users/testers played the most important role of the pilot. Without their use and testing of CMBHS-BETA in an active clinical setting, it would be difficult to know how well CMBHS-BETA will meet the needs and requirements of our customers. **The <u>pilot users</u> (***See Appendix I:* CMBHS-BETA *Authorized Users)* **deserve special recognition and acknowledgment.** The pilot sites, their executive directors (E.D.) and the number of pilot users at each location (shown in parentheses) are listed below:

1. **The Helen Farabee Regional MHMR Centers, Raymond A. Atkins, E.D. (5)**
2. **Lakes Regional MHMR Center (NorthSTAR), John Delaney, E.D. (8)**
   a) Value Options, Jack Szczepanowski, E.D.
3. **Lubbock Regional MHMR Center, Cathy Pope, E.D. (4)**
4. **Tarrant County MHMR Community Center, Jim McDermott, E.D. (5)**
5. **Amarillo Council on Alcoholism, Cynthia Creswell, E.D. (2)**
6. **Managed Care Center for Addictive/Other Disorders, Susan Lilly, E.D. (7)**
7. **Recovery Resource Council, Eric Niedermayer, E.D. (3)**

B. CMBHS Steering Committee

The CMBHS Steering Committee is chaired by the project sponsor and includes representatives from the MHSA Division administration, DSHS IT, CMBHS Training and Support staff and MHSA clinical subject matter experts. The steering committee is charged with providing high level guidance and support to the project to include funding and accountability. The members of the steering committee and their titles are listed below:

1. **Mike Maples, CMBHS Sponsor, Asst. Commissioner of MHSA Services**
2. **Tom Best, Interim Director, MHSA Program Services Section**
3. **Steve Eichner, Mental Health Transformation Project Staff Member**
4. **Stew Urbach, Manager, Mental Health & Substance Abuse Application Support Branch, IT Application Development Unit**
5. **David Speegle, CMBHS Project Manager**
6. **Debabrata Mitra, CMBHS System Architect**
7. **Phyllis Polito, IT Project Administrator**
8. **Kevin Davis, CMBHS Focus Group Leader**
9. **K.J. Scheib, NorthSTAR Contract Manager**
10. **John Keppler, M.D., Clinical Director, Substance Abuse Services**

C. CMBHS Focus Group

The focus group, also referred to as the design team is comprised of subject matter experts. Their job is to describe proposed CMBHS functionality ("use cases") in terms that permit the CMBHS software programmers to develop the application. A few examples of CMBHS functionality, or "use cases", are patient assessment, admission, treatment plan, progress notes, discharge assessment and discharge. The focus group is comprised of a core group of subject matter experts (SME). Other SMEs are consulted, as needed, when a specific functionality or use case is under consideration. The core membership of the focus group is as follows:

1. **Kevin Davis, Focus Group Leader**
2. **Jackie Webster, MH Specialist**
3. **Glenn Richardson, SA/BHIPS Specialist**
4. **Valerie Shown, MH Specialist**
5. **John Keppler, M.D., SA/BHIPS Specialist, Clinical Director, S.A. Services**
6. **Prashant Gupta, Systems Analyst**

D. CMBHS Programmers

The CMBHS programmers, also referred to as the development team, are charged with taking CMBHS-BETA functional requirements, or "use case" descriptions provided by the Focus Group and converting that into computer code to create the CMBHS-BETA software application. In addition to initial product development, during the course of the pilot the development team solved problems brought to their attention by the pilot site users resulting in four (4) beta upgrade releases by the end of the pilot. This responsiveness demonstrated a commitment to improve CMBHS and satisfy the customer. The core development team consists of the following individuals:

1. **Debabrata Mitra, CMBHS System Architect**
2. **Bailey Moore, Developer/Framework Specialist**
3. **Lavanya Perala, Test Lead**
4. **Laxmikanth Vallamsetla, Tester**
5. **Mathavi Paramasivam, Developer, Data Exchange**
6. **Norman Williams, Rational Tools administrator**
7. **Ram Chinnachamy, Developer/Framework Specialist**
8. **Toby Steele, Developer**
9. **Victor Banda, Developer/Reports Specialist**
10. **Hugh Yasumoto, Database Administrator**
11. **Terri Washington, Systems Analyst**

E. CMBHS Training and Technical Assistance Team

The CMBHS Training and Technical Assistance Team provided the initial one-day CMBHS user training, initial pilot site set-up services and ongoing user support. The CMBHS user support system is a pager-based system operating during business hours Monday through Friday. Users call a 1-800 pager number and a support team member returns the call to provide live online support. The five-member support team performs a dual function by providing user support for CMBHS in addition to the Behavioral Health Integrated Provider System (BHIPS) software application slated to be replaced by CMBHS. The CMBHS Training and Support Team during the pilot included the following staff members:

1. **Glenn Richardson, BHIPS/CMBHS Coordinator**
2. **Marlene Creel, BHIPS/CMBHS Specialist**
3. **Brenda Briseno BHIPS/CMBHS Specialist,**
4. **Jelka Jonker, BHIPS/CMBHS Specialist**
5. **Brian Keenan, BHIPS/CMBHS Specialist**

III. Project Description

A. Original Pilot

CMBHS-BETA is the beta or test version of an electronic health record (EHR) web application designed for use by DSHS contract community mental health and substance abuse service providers. The **purpose** of the CMBHS-BETA software pilot was to evaluate its technical, administrative and clinical functionality and the effectiveness of the user interfaces, training and support systems by obtaining feedback from real users in a live clinical environment. In addition, the beta pilot provided an opportunity to examine software release management and deployment processes in preparation for the calendar year 2009 CMBHS production deployment. The CMBHS "Data Exchange" feature, planned for later release, was not a test component of the CMBHS-BETA pilot. (A detailed description of the Beta release Rollout Plan (BRRP) and the BRRP Work Plan are found in the appendices as *Appendix A. Beta Release Rollout Plan* and *Appendix B. BRRP Work Plan Tracking Sheets* respectively.)

The **scope** of the original 90-day pilot required three (3) or more users at each of seven (7) DSHS contract community mental health and substance abuse provider pilot sites to enter actual "admission to discharge" client data in CMBHS-β for a minimum total of thirty (30) clients per pilot site to test the "primary" functions of CMBHS-BETA. This meant each of the

thirty-four (34) authorized pilot users had to record actual client data in their local manual or electronic medical record system and enter the same information in CMBHS-BETA. The following is a list of the **"primary" administrative and clinical** CMBHS-BETA **functions** user-tested during the pilot:

1. **Online help**
2. **Technical functionality**
3. **Administrative functionality**
   a. provider set-up
   b. location set-up
   c. User account set-up
   d. System security
4. **Clinical functionality**
   a. Search for a client record
   b. Create a client record
   c. Conduct client screening
   d. Admission
   e. Assessment
   f. Develop a treatment plan
   g. Conduct a treatment plan review
   h. Create and end service
   i. Enter progress notes
      (1) Administrative notes
      (2) Group notes
      (3) TIMA notes
   j. Discharge assessment
   k. Discharge

B. Extension

The pilot data entry target proved to be a daunting task for our thirty-four (34) pilot users. Each pilot site agreed to enter CMBHS-BETA "admission to discharge" for thirty (30) clients. Seventy-five (75) days into the ninety (90) day pilot, an analysis of the data entry progress revealed the thirty (30) clients per pilot site data entry goal was too high. At this point the CMBHS Steering Committee surmised the low data entry rate was a side effect of "dual data-entry" requirement. Adequate testing of the primary functions of CMBHS-BETA would be at risk unless data entry levels were improved or adjusted.

In response to the data entry shortfall, on April 4, 2008 the CMBHS Steering Committee extended the original ninety (90) day pilot by an additional sixty (60) days and adjusted the data entry target from thirty (30) to twenty (20) clients per pilot site. Additionally, to ensure adequate testing of the CMBHS-BETA discharge assessment and discharge functions, the steering committee allowed pilot users to enter "artificial data" for these functions if it looked like a client would not be clinically ready for discharge by the end of the June 15, 2008 pilot. However, the pilot users were instructed to enter only actual client treatment data in their provider's primary medical record. With the new provisions and extended time frame, the end

date for the beta pilot was re-set for June 15, 2008. The new duration of the pilot was now extended to one hundred fifty (150) days.

1. Final Data Entry Status by Function and Pilot Site

The new pilot extension data entry targets of twenty (20) clients per pilot site created an achievable target for the pilot participants. Of the nine (9) CMBHS-BETA functions, two (2) fell short of their data entry targets at one pilot site. (*See Appendix C:* CMBHS-BETA *Pilot Data Entry Summary Report.*) The two (2) functions are Discharge Assessment and Discharge. However, with regard to the Discharge function, "over-target" data submitted by the other six (6) pilot sites ensured the overall target was exceeded by 29.2%. Likewise, with the Discharge Assessment function, when you include "over-target" data from the other six (6) pilot sites, the overall target fell short by only four (4) cases or 3.34%.

IV. Pilot User Training, Communication and Support

A. CMBHS-BETA Training

Two types of CMBHS training were provided in Austin at the January 2008 outset of the pilot. These were "Hands-on User Training" and "Overview/Read-only Training". Pilot Site data entry staff received "hands-on" training. They were taught "read and write" skills necessary to enter and retrieve actual client data in CMBHS-BETA during the pilot. MHSA NorthSTAR staff received "overview/read-only" training where they were introduced to CMBHS-BETA and its major functions, but were not taught data entry skills.

Because the volume of future training is predicted to be sizable, the CMBHS-BETA Training and Support Team requested and received additional training equipment. The major additions were thirty (30) laptop computers, a wireless router and a computer projection unit. The laptop computers are configured for use in a wireless (WiFi) environment with Internet access as is available in the Austin State Hospital (ASH) Building 636 BHIPS and HIV Training Center. Due to their portability, however, they can be used anywhere. With these new training resources, up to forty (40) persons can be trained at once in the ASH Building 636 Training Room. The CMBHS-BETA pilot training occurred in Austin, but future CMBHS training can be held wherever WiFi and Internet access are available.

Below are detailed descriptions of the two (2) main CMBHS-BETA training events. Both training types received an overall rating of "Good" from the combined thirty (30) participants. A detailed summary of the participants' evaluation of the training can be found in the appendices. (*See Appendix D: Pilot Participant Training Evaluation Summary Data*)

1. Hands-On User Training

CMBHS-BETA pilot user training was provided to twenty-four (24) users by members of the MHSA CMBHS Training and Technical Assistance Team at the ASH Building 636 Training Room. Sixteen (16) CMBHS-BETA SA users received one-day pilot training on January 8, 2008, and eight (8) CMBHS-BETA MH users received the training on January 9, 2008. Glenn Richardson was the lead trainer assisted by Marlene Creel, Brenda Briseno and Jelka Jonker.

Owing to the success of MHSA BHIPS training, CMBHS-BETA user training was designed, taught and presented in much the same way as BHIPS training. The format is classroom style employing a lead trainer and one or more assistant trainers. The lead trainer works from one side at the front of the classroom. Using a software projector, a live feed of CMBHS-BETA is displayed on a screen at the front of the class while the lead trainer describes and demonstrates the functions of CMBHS-BETA. Additionally, each student is provided a notebook computer with live feed of CMBHS-BETA. After a function is demonstrated, students are given an exercise based on that function where they are asked to either enter or retrieve data in CMBHS-BETA. Meanwhile, assistant trainers monitor and assist individual students with practice exercises.

2. Overview/Read-Only Training

The overview/read-only training was designed and conducted primarily for the MHSA Community Services NorthSTAR staff. Six (6) "in-house" MHSA NorthSTAR staff members attended the three (3) hour January 24, 2008, training at the ASH Building 636 Training Room.

For the "overview/read-only" training, the lead trainer again used a software projector to display a live feed of CMBHS-BETA while he described and demonstrated its major functions. As before, each student had a notebook computer with a live feed of CMBHS-BETA so they could follow the demonstration and navigate the application. Students were not instructed in data entry skills. The class was designed to teach "read only" skills with the primary focus of familiarizing class members with the major functions, learning how to navigate within the application and locate information. This training was a prototype for in-house MHSA users who conduct community provider performance and utilization reviews, in addition to community providers who elect to populate CMBHS through the Data Exchange process but "read" data in CMBHS.

B. Pager-based User Support Help Desk

Throughout the pilot, users received software support through the Behavioral Health Integrated Provider System (BHIPS) Training and Technical Assistance (T&TA) Team. The BHIPS TT&A Team was employed in a dual capacity to provide training and support for BHIPS and CMBHS-BETA users. The CMBHS-BETA Pilot Help Desk (HD), like the BHIPS HD, is a pager-based system available to users Monday through Friday, 8 AM to 5 PM, except State and Federal Holidays.

Users were encouraged to use the CMBHS-BETA online help utility, but if they encountered a problem not solvable through online help they were to contact the CMBHS-BETA HD. The HD employed two (2) toll-free pagers with at least two (2) BHIPS/CMBHS T&TA team members monitoring the pagers during business hours. Users calling the toll-free pager were to expect a call-back within fifteen (15) minutes. If the user did <u>not</u> receive a call back within fifteen (15) minutes of calling the first pager, they were instructed to contact the second pager. After-hours callers had their page returned first thing the next business day.

One of the unique features of the CMBHS-BETA HD was the ability of support staff to view the same screens as the user. Additionally, if the user saved a document in "draft" form, the support staff could access the document and review it with the user. Afterward, the user could make necessary corrections and re-file the corrected final form.

1. STRS Evaluation ratings for the CMBHS-BETA Help Desk

"Telephone Support" received an overall rating from all users of "Satisfactory". It ranked second in overall satisfaction of the seven (7) pilot functions. (*See Appendix E: STRS User Satisfaction Data Summary* for a detailed review of the STRS data.) Users completing the STRS Evaluation were most impressed by the support staff's knowledge and ability to resolve problems. However, one area evaluators thought could use improvement was to reduce the length of "hold time".

C. User Support Teleconferences

In an effort to facilitate communication between CMBHS-BETA designers, developers and users, a series of one-hour teleconferences were held throughout the pilot timeframe. During the twenty-two (22) week period of the pilot (January 14 to June 15, 2008) fourteen (14) teleconferences were held. From the provider side, all registered CMBHS-BETA pilot site users, the CMBHS-BETA Application Administrator, the CMBHS-BETA Primary Contact and the pilot sites' Executive Directors were invited to participate. MHSA staff participating in the conference calls included the CMBHS Focus Group, members of the Training and Technical Assistance team, the Project Manager, the CMBHS System Architect and the online help developer. Doug Hancock, Project Consultant, moderated the calls. The format was a telephone conference call with between 14 and 30 participants. The calls generally lasted an hour and followed a set agenda. The agenda was composed of updates from various members of the CMBHS-BETA design and development teams followed by the user submitted agenda items. When time permitted, a portion of the teleconference was spent in "open forum" where users were free to say anything on their mind concerning CMBHS-BETA or ask questions.

One intended purposes of the teleconferences was to create another level of user support beyond that available through the CMBHS-BETA pager-based help desk. If a problem could not be resolved through a help desk interaction, the user was encouraged to submit the issue as a teleconference agenda item for review and discussion during an upcoming call. In addition to unresolved help desk issues, agenda item suggestions for system improvement, including change requests, were discussed and considered. As a result of the teleconferences, one hundred twelve (112) separate issues were brought to the table. These issues were subsequently vetted by the CMBHS Focus Group to identify duplicates, user errors and system "bugs". Many of these remaining "agenda item" issues were classified as "change requests". (*See Appendix F: Beta Pilot Change Requests Log*)

Another function of the teleconference process was to provide the pilot site users with a tangible connection to the development component of the CMBHS project. Prior to the teleconferences, user feedback suggested MH and SA community providers did not feel like they had a fully collaborative role in the development of a product they would be required to use. User collaboration and "buy-in" are well-known essentials to the success of custom automation projects. Customers want to know their concerns and ideas are heard, considered

and incorporated. It is noteworthy that the pilot users awarded the User Support Teleconferences the highest overall rating of the seven (7) pilot functions included in the CMBHS-BETA Pilot Software, Training, Rollout and Support (STRS) evaluation. (*See Appendix E: STRS User Satisfaction Data Summary) for a closer review of STRS data.*)

Since the pilot's conclusion, a routine means of two-way communication and collaboration between the providers and CMBHS designers and developers has been absent. In July, the pilot sites requested a meeting with the CMBHS-BETA designers and developers to discuss pilot outcomes, future directions and the reconciliation of local workflow processes with CMBHS-BETA design and layout. The strength of the partnership and collaboration with our provider users would seem contingent upon establishing a regular communication forum, rather than a series of special called meetings. The success of the pilot teleconference process suggests a similar communication and collaboration model would serve the designers, developers and the users well prior to the upcoming production release development and rollout process.

D. CMBHS Website "Contact Us" Feature

Although not a formal component of the CMBHS-BETA Pilot, another means of communicating with the pilot site users, and other interested parties, was through the CMBHS Website "Contact Us" page function. The CMBHS website provides basic and in-depth information about CMBHS. Additionally, this avenue of inquiry allows anyone with Internet access to make inquiries, requests and reports, to include the following:

- Change request
- Enhancement request
- Information request
- Speaker request
- "Bug" report

During the one-hundred-fifty (150) days of the extended pilot, twelve (12) such requests were received. A lapse in daily monitoring for new inquiries in addition to a temporary disconnect between the MHSA Information Services department and the CMBHS team, resulted in a low volume of inquiries. This circumstance allowed several of the twelve (12) inquiries to remain unnoticed for a period of months. However, this lapse in coordination was corrected immediately following its discovery in the final weeks of the pilot. Again, the "Contact Us" feature was not considered a formal component of the CMBHS-BETA Pilot. It is mentioned here because it was an active communication channel during the pilot and accessible to pilot users.

V. Change Requests

A change request is an <u>approved</u> work order directing software developers and programmers to create new functionality or modify or delete existing functionality. Change requests can emanate from a variety of sources to include the following:

- Users
- Owners/sponsors
- Designers
- Developers

However, within the context of a beta pilot, the beta developers, testers and users are the primary sources of change requests. This was certainly the case with the CMBHS-BETA pilot where the CMBHS-BETA Focus Group and the CMBHS-BETA Pilot users generated most of the change requests.

Software design, development and testing can be costly. The same is true for modifying or "re-writing" existing code to alter the functionality of a current application. CMBHS is no exception. As is usually the case, the CMBHS project operates on a limited budget. Therefore, unplanned modifications to CMBHS frequently come at the expense of existing functionality or another requested modification. It would be an unachievable goal to craft a custom application that satisfied every desire and nuance of the user community. It is generally accepted that the larger the user community, the greater the challenge in achieving the satisfaction of every member in the community. For this reason, it is important to remember every suggestion for application change or improvement cannot become an *approved* change request until it's been painstakingly vetted between the original requestor and the designers and developers, then approved by the owners/sponsor. Each suggestion to change or modify CMBHS must go through a cost benefit analysis process to determine if the change will add sufficient value to the end product to justify the expenditure. After a suggestion satisfies the cost benefit analysis, it is prioritized along with other change requests. Change requests with the highest priority are given approved status and put in queue for implementation as funds and resources are made available.

A. Sources

As referenced previously, the CMBHS-BETA Pilot provided several avenues for pilot participants and non-participants alike to submit suggestions for software change and modification. These are listed and discussed below.

1. Teleconference "Agenda Items":

This was the greatest source of change requests. As described above in the "User Support Teleconferences" section, pilot participants were asked to submit their suggestions for change in the form of "agenda items". Each agenda item received was added to the next scheduled teleconference agenda. During the teleconference, submitters were given an opportunity to explain their suggestion and answer questions from the attending design and development team members and the other pilot site users.

Next, the vetted suggestion was added to the "Change Requests Log" for further consideration and prioritization by the CMBHS Focus Group. One-hundred-thirteen (113) suggestions for change were submitted by the seven (7) pilot sites over the course of the beta pilot and added to the Change Requests Log including the "Items to Be Deleted" described next.

2. Teleconference "Items to be Deleted" Requests

When the decision was made to extend the original ninety-day (90) pilot another sixty (60) days, one of the pilot sites' Executive Director requested a survey among the pilot site users to identify "items to be deleted". The idea was to review CMBHS-BETA screens and identify fields requesting "irrelevant or unnecessary" information. Four (4) of the seven (7) pilot sites submitted a total of twenty-three (23) "items to be deleted".

These were classified as change requests and processed the same as teleconference agenda items.

3. CMBHS "Contact Us" Items

The "Contact Us" communication component of the CMBHS-BETA Pilot was described above in item IV.D. This venue, while not a primary source of suggestions for change during the pilot did, nonetheless, generate suggestions that will be reviewed outside the scope of the pilot.

B. Disposition

1. Focus Group Decisions and Recommendations

All one-hundred-thirteen (113) of the change suggestions submitted through the teleconference process, this includes the twenty-three (23) "items to be deleted", were examined by the CMBHS Focus Group. The Focus Group compared requests to reconcile duplicates, group similar requests and ferret out issues determined to be user error, training issues or those that were "bug-related". Lastly, the focus group made recommendations to recommend or not recommend each request before its addition to a prioritized list for implementation as funding permits.

2. Change Requests Log and Change Request Disposition Table

The Change Request Tracking Log includes a complete listing of all suggestions for changes and revisions submitted during the pilot. The Change Request Disposition Table discloses the Focus Group's disposition of each item in the Change Request Log. The disposition table is cross-referenced to the change request tracking log by "teleconference date" and "agenda item" letter (ex., teleconference date 2/22/08, agenda item "P"). To discover what became of an item in the Change Requests Log, just look up the same item in the Change Request Disposition Table to see if the request was recommended or not recommended by the Focus Group. (*See Appendix F: Beta Pilot Change Requests Log, and Appendix F_2: Change Request Disposition Table*).

VI. Beta Upgrade Releases

Throughout the pilot, the CMBHS design and development teams took swift action with a number of the suggestions submitted, especially "bug" problems. Because these changes improved functionality or corrected a problem, these were approved quickly and incorporated into "beta release upgrades" distributed during the pilot. There were four beta release upgrades with a total of thirty-four (34) change requests implemented. The following is a listing of the four (4) beta upgrade releases by date of release and the number of changes incorporated in each release.

A. Beta Upgrade Release 1

This upgrade was released on February 26, 2008, with a total of fifteen (15) change requests included.

B. Beta Upgrade Release 2

This upgrade was released on March 27, 2008, with a total of four (4) change requests included.

C. Beta Upgrade Release 3

This upgrade was released on May 5, 2008, with a total of seven (7) change requests included.

D. Beta Upgrade Release 4

This upgrade was released on May 30, 2008, with a total of eight (8) change requests included.

A listing of each of the four (4) releases and a description of the related change requests can be found in the appendices. (*See Appendix G:* CMBHS-BETA *Upgrade Releases.*)

VII. Hardware Performance

There are two primary dimensions of application performance that can be evaluated in a beta pilot. The first is software performance, or how efficiently and effectively the application performs the business functions it was designed to automate and replace. The second dimension is hardware performance or the availability, reliability and efficiency of the information technology architecture, devices and system of devices the software is loaded on. No matter how well the application developers do their job, if the hardware does not meet minimum software design and performance requirements or cannot deliver the application to the user's desktop, the benefit and effectiveness of the application is compromised.

While there are a number of dimensions to hardware performance, for the purposes of the CMBHS-BETA Pilot and this report, we will concern ourselves with two (2). These are the application server availability and user workstation performance. Each is discussed below.

A. Application Server

CMBHS-BETA is a web-based application. The application resides on a DSHS web-server. User clients gain access through local desktop computer via the Internet. In the case of CMBHS-β, the web-server functions as the application server. Because CMBHS is an electronic health record (EHR) application, it must be available for use by community MH and SA providers just as readily as conventional paper patient records. This means "twenty-four/seven/three-sixty five (24/7/365) availability. Availability at levels less than the EHR industry standard of 99.9% can compromise patient care and service delivery. Although true "end to end availability" involves every component from the application host web server, power sources, routers, hubs, cabling and Internet availability to the local user cabling, routers, hubs and desktops; application server availability is the critical component of reliable customer access.

1. Access during Pilot

During the one-hundred-fifty (150) day pilot, CMBHS-β server was available 98.57% to 98.78% of the time. When comparing pilot availability to the 99.9% EHR industry standard; CMBHS-BETA was not available to pilot users for nearly 48 hours during the course of the pilot. Maintaining CMBHS server availability at EHR industry standard levels will be an area to examine for improvement prior to the calendar year 2009 planned CMBHS production release. (See Appendix H: Server Availability Data for more details.)

B. Pilot Sites

Because **CMBHS-BETA** is a web-based application, user-end technology requirements were neither excessive nor elaborate.

1. Minimum hardware specifications:

- 400 megahertz (MHz) Pentium personal computer
- 512 megabytes (MB) of RAM
- Windows 2000 or XP
- 15-inch monitor with Super VGA (800 × 600) or higher resolution
- High-speed Internet connection
- Internet Explorer 6.0

There were no reports of users attempting to run CMBHS-BETA on workstations without minimum specifications. However, several users operating notebook computers meeting the above specifications did experience some performance problems. These are explained below.

2. In-Field "AirCard" Performance Issues:

During the **CMBHS-BETA** pilot several instances of performance problems were reported by users accessing CMBHS via notebook computers equipped with "AirCards". The notebook computers met minimum workstation specifications. The AirCards allowed field staff to access **CMBHS-BETA** on the Internet via wireless cell phone networks. Apparently AirCard transmission rates are below those of conventional cable transmission. However, following reports of the slower response, **CMBHS-BETA** architects made modifications to how the screens refreshed. This resulted in some improvement in AirCard users' performance problems. Locally, pilot site information technology departments modified AirCard notebooks' configurations achieving additional improvement in performance.

VIII. Shutdown Activities

The official end date for the **CMBHS-BETA** Pilot was June 15, 2008. However, following the official end date, a number of "shutdown" activities were necessary to close out the pilot. These activities are described below.

A. Final Data Entry

As mentioned above, the **CMBHS-BETA** pilot officially concluded on June 15, 2008. However, to complete data entry at target levels, authorized users (*See appendix I:* **CMBHS-BETA** *Authorized Users)* were granted **CMBHS-BETA** access an additional two (2) weeks through June 30, 2008. After June 19, 2008, however, no additional data was entered for the remainder of the month through June 30th. The final level of data entry met revised data entry targets adequately enough to test the major components of **CMBHS-BETA** in addition to the key features of the rollout and deployment processes.

B. Completion of the Software, Training, Rollout and Support (STRS) Evaluation

Besides granting access to pilot users through June 30th to complete their **CMBHS-BETA** data entry requirements, **CMBHS-BETA** was also available to users to complete the online STRS Evaluation. Of the thirty-four (34) registered pilot users, eleven (11) completed the STRS evaluation. The final return rate was 32.4%, slightly above the expected completion rate of 25%. A summary of the STRS Evaluation data can be found in the appendices. (*See Appendix E: STRS User Satisfaction Data Summary*)

C. Disabling User Access to CMBHS-BETA

Following the completion of pilot users' data entry and the STRS evaluation, the application was shut down on July 3, 2008 @ 9:44 am.

D. Disposition of Pilot Data

The terms of the pilot agreement between DSHS MHSA and the seven (7) named pilot sites with regard to the termination of the **CMBHS-BETA** pilot and data disposition are as follows:

> *"(This) agreement … shall terminate when all of the protected health information provided by Covered Entity (named pilot sites) to Business Associate (DSHS MHSA), or created or received by Business Associate on behalf of Covered Entity, is destroyed or returned to Covered Entity …"*

At this time the pilot data is still under review and analysis, but only available to a restricted set of person associated with the **CMBHS-BETA** pilot. When the data is no longer required, it will be destroyed or returned to the individual pilot sites, as described in the terms above. At this time, no date has been determined. When the date is decided, all pilot sites will receive formal notification of the method and process of disposition.

IX. STRS User Satisfaction Evaluation and Results

The STRS User Satisfaction Evaluation is an online instrument developed to measure the satisfaction level of our **CMBHS-BETA** pilot users with respect to the following four (4) major features of the **CMBHS-BETA** Pilot:

- The **S**oftware Application
- User **T**raining
- The **R**ollout or deployment process, and
- User **S**upport

A. STRS User Satisfaction Evaluation Description

The STRS Evaluation contains eighty-eight (88) items divided into seven (7) key components of the **CMBHS-BETA** Pilot. These are as follows:

1. **Architecture and Design**
2. **Training**
3. **Pilot Users Teleconferences**
4. **Online Help**
5. **User Telephone Support**
6. **Software Functionality**
7. **Rollout Process**

Each of the eighty-eight (88) items can be rated by the user with regard to their level of satisfaction on the following five-point Likert scale:

- 1-Very Dissatisfied
- 2-Dissatisfied
- 3-Neither Satisfied or Dissatisfied
- 4-Satisfied
- 5-Very Satisfied

Some items are weighted more than others. Individual item weights were derived using data received from the CMBHS Design and Developments Teams and the seven (7) pilot sites Primary Contact Persons subsequent to their rating each STRS Evaluation item with regards to relative importance within its category.

Each user was allowed to complete the STRS Evaluation as often as they desired, however only their final evaluation was "counted" and used to assess the pilot. This was accomplished through the use of an overwrite process. Each time a user completed the evaluation, their previous evaluation responses were written over leaving only one completed STRS Evaluation per pilot user in the CMBHS STRS database.

Of the thirty-four (34) registered pilot users, eleven (11) completed the STRS Evaluation before the access to **CMBHS-BETA** was disabled at the conclusion of the pilot.

Below is a summary of the compiled data from the eleven (11 pilot site users.

B. Summary of Data

1. Eleven (11) of a possible thirty-two (32) evaluations were completed or 33%

a) A return rate of 25% or better is considered a normal rate of return.

b) Seven (7) of the eleven (11) evaluations were completed by SA provider users.

c) Four (4) of the eleven (11) evaluations were completed by MH provider users.

2. Five (5) of the seven (7) pilot sites completed one or more of the eleven (11) STRS evaluations

a) Amarillo Center for Alcoholism and Drug Abuse: two (2)
b) Helen Farabee Regional MHMR Center : two (2)
c) Lakes regional MHMR Center: three (3)
d) Managed Care Center for Addictive/Other Disorders: three (3)
e) Recovery Resource Council: one (1)

3. STRS Categories listed by most important to least important as determined by assignment of item weights by pilot sites and CMBHS-BETA **Team members**

a) User Telephone Support
b) Online Help
c) Rollout Process
d) Software Functionality
e) Training
f) Pilot Users Teleconferences

4. STRS All Users Overall Satisfaction Level: "Satisfied" (% Rating: 77.49%)

a) SA Users Overall Satisfaction level: "Satisfied" (% Rating: 77.22%)
b) MH Users Overall Satisfaction Level: "< Satisfied" (% Rating: 74.89%)

5. STRS Categories by satisfaction level:

Note:
*<< **:** Lowest end of "Satisfied" or" Very Satisfied" rating category;*
*< **:** Low end of "Satisfied" or" Very Satisfied" rating category;*
***% Rating :** Percent of available satisfaction score;*
***Rank :** 1-5 scale with 1 being highest level of satisfaction*

a) Pilot User Teleconferences:
   (1) All Users: "Very Satisfied" (% Rating: 88.88%) (Rank: 1)
   (2) SA Users: "Very Satisfied" (% Rating: 89.21%) (Rank: 1)
   (3) MH Users: "Very Satisfied" (% Rating: 90.33%) (Rank: 2)

b) Telephone Support:
   (1) All Users: "Satisfied" (% Rating: 80.84%) (Rank: 2)
   (2) SA Users: "Satisfied" (% Rating: 78.72%) (Rank: 2)
   (3) MH Users: "Very Satisfied" (% Rating: 93.95%) (Rank: 1)

c) Rollout Process:
   (1) All Users: "Satisfied" (% Rating: 77.76%) (Rank: 3)
   (2) SA Users: "<< Very Satisfied" (% Rating: 78.34 (Rank: 3)
   (3) MH Users: "Satisfied" (% Rating: 76.14 (Rank: 3)

d) Software Functionality:
   (1) All Users: "Satisfied" (% Rating: 75.64%) (Rank: 4)
   (2) SA Users: "Satisfied" (% Rating: 76.74%) (Rank: 4)
   (3) MH Users: "< Satisfied" (% Rating: 72.77%) (Rank: 5)

e) Online Help:
   (1) All Users: "< Satisfied" (% rating: 74%) (Rank: 5)
   (2) SA Users: "< Satisfied" (% Rating: 74.25%) (Rank: 5)
   (3) MH Users: "<< Satisfied" (% Rating: 73.09%) (Rank: 4)

f) Architecture and Design:
   (1) All Users: "<< Satisfied" (% Rating: 72.31%) (Rank: 6)
   (2) SA Users: "<< Satisfied" (% Rating: 73.79%) (Rank: 6)
   (3) MH Users: "<< Satisfied" (% Rating: 68.02%) (Rank: 7)

g) Training:
   (1) All Users: "<< Satisfied" (% Rating: 71.31%) (*Rank: 7)
   (2) SA Users: "<< Satisfied" (% Rating: 71.88%) (*Rank: 7)
   (3) MH Users: "<< Satisfied" (% Rating: 69.85%) (*Rank: 6)

6. Quality Issues by Category (Features users liked and those to improve)

a) Architecture and Design
   (1) "Like"
      (a) Logon response time
      (b) Screen refresh time
      (c) Screen to screen speed
   (2) "Improve"
      (a) Use of color
      (b) Date format
      (c) Use of radio buttons

b) Training
   (1) "Like"
      (a) Training effectiveness
      (b) Understandability
   (2) "Improve"
      (a) Registration process
      (b) Location
      (c) Post-training follow-up

***Note:** One evaluator from the MCCAOD scored this area particularly low. It is possible this evaluator did not attend the January Austin **CMBHS-BETA** Training. Some new users were added when the pilot was extended in April 08 after the January 08 training. If this one low evaluation is factored out of the satisfaction ratings, training would rank somewhere between the third and fourth highest satisfaction rating.

c) Pilot User Teleconference
   (1) "Like"
      (a) Follow-up on issues
      (b) Resolution of issues
   (2) "Improve"
      (a) Agenda format
      (b) Item submission process

Note: This component of the pilot received the most favorable ratings from the evaluators. `Since the conclusion of the pilot on 6/15/08, our customers are without a routine forum for obtaining information about CMBHS. A communications "blackout" during the production release development process could compromise the good will earned during the pilot.

d) Online Help
   (1) "Like"
      (a) Accuracy
      (b) Understandability
   (2) "Improve"
      (a) Graphics

e) User Telephone Support
   (1) "Like"
      (a) Staff knowledge
      (b) Problem resolution
   (2) "Improve"
      (a) Hold times

Note: One evaluator did not rate this area because they did not use Telephone Support.

f) Software Functionality
   (1) "Like"
      (a) Search for client record
      (b) Create client record
   (2) "Improve"
      (a) TIMA note
      (b) Discharge
      (c) Spell check

g) Rollout Process
   (1) "Like"
      (a) Elapsed time from train to use
      (b) Time allotted for pilot site preparation
   (2) "Improve"
      (a) Evaluation process (STRS)

(b) Evaluation form

7. **Highest to lowest satisfaction rating by MH or SA pilot site type:**
   a) 4 of the highest ratings came from SA providers
   b) 3 of the lowest 5 ratings came from MH providers

X. Lessons Learned

As a final exercise of the pilot evaluation process, members of the **CMBHS-BETA** Pilot Team were asked to describe "lessons" they learned from the pilot. Not every member of the team responded to the request. The comments are purely subjective and were not edited for content. These are listed below in four categories: communication, workgroups, training and pilot sites.

A. Communication

1. The pilot teleconferences worked well. Both the DSHS staff and providers were engaged in the process.
2. There is a need for general improvement with regard to internal communication and coordination with team members.
3. There must be immediate communication between IT and non-IT staff whenever there are server problems or system bugs.
4. There is a need for better coordination of contractual issues to ensure things do not inadvertently "falls through the cracks".
5. Team for Texas is required to review and approve CMBHS database changes. Under normal circumstances the database changes should be submitted to Team for Texas at least one day before the date you need approval. Once approved, implementing the changes can take another one to two days. Future application development project processes should allow additional time for this review.

B. Workgroups

1. Because of the amount of time and resources it takes to create a product like CMBHS, a possible cost and manpower savings would be to literally transfer SMEs from their current assignment to the project team (in this case, CMBHS). This is preferable to "borrowing" subject matter experts (SMEs) from other sections or departments in MHSA. The managers of the sections and unit who "loaned" staff to the project have workloads and obligations that must be fulfilled even with fewer available staff. This puts the managers in the unenviable position of continuously struggling to have the loaned staff returned to their unit.
2. There is a significant loss of information when the focus group (this is the CMBHS joint application development or JAD team) is disrupted by absences during a development process. It is essential to have at least two or three SMEs sustained in the workgroup for the quality of the project to maintain continuity.
3. Maintain flexibility with ideas or concepts. The team process results in synergistic outcomes from blending and bending ideas and concepts until the "right" mix is found to create the most efficacious product.

C. Training

1. There is a vital need for online help screens to be clear and precise. Additionally, help screens should be developed with input from the Training and Technical Assistance Staff. Lastly, online help screens would benefit from being developed concurrently with the development of the system screens.
2. There needs to be adequate time allowed for a complete testing of all CMBHS screens prior to pilot or production release user training in order to verify all screens are functioning properly. (This comment came from the Pilot User Training Evaluation Forms.)
3. Verify that training candidates possess basic to moderate computer competencies before attending training. Training can be completed quicker and with less technical assistance when trainees possess prerequisite competencies.
4. A lesson "re-learned" during the pilot training was that user learning is more efficient when the trainee has prior knowledge with which to anchor new information. For instance, during the pilot training, substance abuse providers were able to understand the CMBHS screens faster than the mental health providers because the CMBHS screens are similar to ones in BHIPS (the current substance abuse electronic health record).
5. During training make sure users get an opportunity to try out the specific CMBHS functionality they will use when performing their job.
6. It is extremely important the Training and Technical Assistance Team be involved in testing CMBHS screens prior their release to providers to ensure clinical relevance in addition to functionality.

D. Pilot Sites

1. Because a community MH or SA provider Executive Director "volunteers" their program to participate in the pilot, it doesn't mean their staff will have the time or enthusiasm to fully participate in the pilot.
2. Do not take it for granted that legitimate information will always be entered in the client record. Some staff allowed inappropriate statements to be entered in the CMBHS-BETA pilot client records.
3. The face-to-face CMBHS-BETA Workflow Review meeting with the pilot sites should have been included in the original pilot plan.