Cosgrove Computer Systems Inc.
Software Engineering
7411 Earldom Avenue
Playa del Rey, California 90293-8058
(310) 823-9448

XX-HMO v. Med-SW-Co

Technology Issues -- Summary Points

Conclusions

Med-SW-Co (MSC) essentially performed to the technical obligations described in the contract of February, 200x to the extent made possible by the incomplete corresponding performance of the plaintiff's project staff members. On the other hand, XX-HMO and/or its contractor BBB (collectively HMO) performed in a manner consistent with an intention that the project should not be successful. To that end, project records from April 200x show that HMO's management planned to substitute Competitor-supplied software as soon as possible. Later records and actions by HMO staff were consistent with a true purpose to obtain as much design information about MSC's system as possible instead of completing an operational installation.

1. HMO failed to adhere to defined means to modify and/or augment the work plan requirements as described in the contract, 6.2. This resulted in extensive disagreement, delayed schedules and unnecessary labor as a direct result of incomplete and continuously changing system requirements generated by HMO.
2. HMO unilaterally created acceptance testing requirements and procedures rather than using the agreed-upon performance requirements and established MSC-supplied testing procedures as defined in the contract (6.1 – 6.4). No acceptance test criteria were provided to MSC by HMO. This was the primary cause of the failure to complete acceptance testing and was the stated reason for the ultimate cancellation of the contact in early 200y.
3. HMO's customization requirements were not well defined, so that the project was delayed while specifications were developed and revised repeatedly. Conflicting requirements appeared during testing and were initially identified as software errors, requiring extra work by MSC and additional delays in the schedule.
4. HMO failed to support the training of personnel assigned to operating and testing/evaluation of the MSC system as required by 6.2, Ex. G (1.1) and the subsequent Work Plan (WP 3/27/0x). Untrained HMO personnel were cited as a major source of erroneous failures, schedule delays and extra labor expenditure by MSC staff.
5. Although by November of 200x HMO management was seriously considering terminating the contract[1], there was no attempt to minimize the potential costs of such a move to MSC. The demands on MSC for new changes, some nearly frivolous, increased sharply. There was no attempt to focus on the highest-priority problems. Instead, the HMO team members working most closely with MSC were instead analyzing HMO's project management problems[2], and making elaborate plans to proceed[3] which caused MSC to continue to expend resources and to supply additional design information in a good-faith effort to meet HMO's demands. This continued until the termination letter on 4/30/0y.
6. MSC obviously provided much more than the 30 hours' customization required by the contract. Even if HMO were justified in rejecting the MSC software, they still have an obligation to pay for the extra customization.

HMO Claims – MSC System Failed Acceptance Testing

1. The MSC "software repeatedly and consistently failed all pre-production acceptance testing." (14)
2. HMO notified MSC on multiple occasions from 7/18/0x through 4/30/0y that the software had failed the acceptance tests."(15)
3. Despite these numerous opportunities, MSC has failed to provide software satisfying the specifications … set forth in the agreement and work plan …" (17)
4. MSC has also failed to provide application customization services …"(19)

Rebuttal to the HMO Claims

1. MSC responded in a timely fashion to the issues raised during user testing. Close examination of the failed issues list (see below) establishes that despite constantly changing requirements, with diligent effort MSC had reduced the remaining issues to a very few remaining with few of any importance. Claims that the software

"failed all … acceptance testing" is contradicted by the project history records. This timely response was in spite of HMO's rejection of MSC's well-defined, mature test process in favor of techniques unilaterally developed by HMO which didn't adequately support developer analysis and resolution of the issues. These HMO-defined test practices also used inconsistent reporting standards for each set of tests resulting in extra difficulty in reproducing and tracking issues.

2. The "acceptance testing" that constituted the basis of the reported "failures" was not composed of the MSC-approved testing as specified in the agreed-upon work plan and the corresponding, well-proven acceptance test procedures provided by MSC and used in multiple MSC installations with notable success. Instead, AH created their own test procedures, without MSC's participation and which had an undefined relationship to the well-established MSC tests. These procedures were developed ad-hoc, with no overall mutually-agreed-to acceptance test plan. Moreover, they often included modified or new user requirements which had not been approved in the manner required by the clear language of the agreement. This (6.1) requires that "The parties may mutually **agree in writing** upon appropriate modifications to the work plan." [Emphasis added.] This modification requirement in the agreement was largely ignored with the effect that the actual requirements and corresponding acceptance test criteria were poorly defined or not defined as "mutually agree[d]" by the parties.
3. Since the project records show that what constituted success in acceptance testing was constantly changing without effective controls on these changes, the reason for MSC's alleged failures is really due to a constantly moving basis for success. Since the work plan had not been changed as mandated by the agreement, the claim that MSC failed to "provide software satisfying the specifications " cannot be accurate until a clear set of requirements to be satisfied is agreed-upon in writing as required by the agreement. These requirements would then form the basis of acceptance testing.
4. MSC has far exceeded the amount of customization included in the contract and could not be expected to continue to provide unlimited free customization with constantly evolving demands. HMO has failed to pay for customization that exceeds the amounts established in the agreement by ignoring the requirement to pay for the excess customization services as defined in the agreement.

Description of Analysis Supporting Rebuttal

Without attempting to respond to every detailed claim, a representative selection of the most important issues are examined from the records of the installation/development process from ~3/200x until the termination in 3/200y.

Key Factors Affecting MSC's Performance to the Contractual Requirements

1. Scope of the Project – Instead of the well-defined set of specifications MSC had been led to expect, HMO produced the specifications piecemeal over several months, changed them during development, and didn't fully convey the final version to their acceptance testing staff, causing delay costs and rework for MSC that were not reimbursed.
2. Barriers to Collaboration -- HMO established procedures and mandated practices which effectively stopped timely resolution of technical issues.
3. MSC Responded to Issues – Within the limits established by HMO's practices, MSC performed in good faith at significantly extra cost to respond to perceived issues. We evaluated their response through analysis of HMO's documentation of functional tests, screen shots, issues lists, and compiled documentation of twelve final issues.
    a. Functional Tests – HMO documented one single set of tests using the forms MSC had provided for ease of analyzing issues and establishing priorities. After that, HMO unilaterally established their own test criteria which bore little or no relationship to the agreed-upon Work Plan as defined by the contractual agreement.
    b. Screen Shots – some HMO issue reports were in the form of prints of what was on the screen, with handwritten markups. These lacked history of how the screen was reached. Again, there was no prioritization.
    c. Issues Lists – eventually HMO settled on reporting via what appears to be an Excel spreadsheet, one row per issue. The information provided varied from report to report, but this format provided even less background for analyzing the issue, and no prioritization until November of 200x when most but not all issues were labeled as required for "Go Live", or input to production. About this time HMO arbitrarily cut off MSC's access to the HMO server, further limiting the amount of information available for solving problems.

4. Rate of Issue Generation – analysis of the Issues Lists shows a sudden spike in HMO's documented number of issues starting in January of 200y, which is not a normal pattern for that stage of a project.
5. Disposition of Closed Issues – a closer look at the source of issues that had been closed shows that only a fraction of them were clearly software errors or "bugs".
6. Go Live Issues – analysis of what eventually happened to the important "Go Live" issues shows that most of them were closed. There were a large number of enhancements that apparently hadn't yet been approved. A large number of issues were closed, then reopened; most of these were changes to the specifications, or enhancements. The few remaining "Go Live" issues were ignored by HMO when it assembled its case against MSC in the "Final 12" issues. – A likely assumption is that they were too controversial or too unimportant to be used.
7. 12 Issues – Just before the termination letter was sent, HMO assembled documentation for 12 issues that are supposed to demonstrate MSC's non-performance. Five of the twelve were brand new. It is doubtful that MSC even had time to review them. The remaining issues were either new or previously closed issues that had just been reopened within the last three months before the letter was sent, at a time that MSC was being overwhelmed with the explosion of new issues starting in January of 200y.
8. Cost of Customization – Analysis of HMO's issues lists turns up clear evidence of at least 198 hours MSC must have spent on the customization that was only supposed to require 30 hours. These hours are estimated very conservatively, and don't take into consideration all the delay costs, communications costs, and extra research required that are apparent but can't be quantified from the information available.

Scope of the Project

The bulk of the custom work required was HMO's set of Charting by Exception (CBE) standards. MSC had been led to believe before the contract was signed that CBE was a standardized practice throughout HMO. In March of 200x MSC discovered that not only was there no supporting documentation to back up the little that they had been shown, but that there were major differences in CBE practices between the facilities. This led to a long delay for developing specifications which were acceptable by all HMO parties[456]. The lack of standards must also have contributed to difficulty in understanding and testing the software by users whose individual practices may not be reflected in that accepted version.

Barriers to Effective Technical Collaboration

Several of the depositions and an email[7] referred to a perceived barrier to communications between the HMO end-users testing the system and the MSC developers trying to deal with their customization and repair issues. Because of that difficulty, the HMO test reports were a primary vehicle for communication of issues and their status. They provide clear, documented evidence of the problems of poor communications, disorganization on the HMO side of the project, and indifference to the developers' needs. After a first use of the test procedures Test Reports 7/18/0x) MSC had developed, documented, and trained HMO to use (Sheet 1 of Test Statistics attachment), those procedures were abandoned. The replacement procedures lacked the contextual information the developers needed to locate the source of problems. Methods of communicating status were introduced and then dropped. Issues were closed or dropped off the report, then reintroduced later because of inconsistencies and inadequate tracking mechanisms. The format changed constantly, reflecting MSC claims that requirements were changing constantly as well.

Communications were difficult. The users with clinical issues passed them to HMO consultants and HMO staff lacking clinical background, who then communicated with MSC, so information was often lost in translation.

HMO's email system often dropped attachments, so MSC set up an FTP site to transfer electronic documents back and forth. However, HMO consultants had limited access to the site, so frequently resorted to FedExing paper documents, which delayed communications and lost the ability to search the documents electronically.

HMO test procedures were inadequate. For instance, the data used when an issue was found were often discarded before the problem reached MSC, so issues arising from using procedures inappropriate for a child of the age given in the data set, or female tests on male patients, were hard to figure out. As a result, MSC testers couldn't reproduce the error in many cases because they were trained to use appropriate data, therefore it took a long time to figure out what happened and some issues could not be reproduced at all.

MSC Response to User-Initiated Problems

Looking at the question of whether MSC responded reasonably to user problems during the development process, successive user reports were analyzed to determine whether MSC was responding to the issues and fixing those for which they were responsible, in a timely manner. The records showed that MSC was responsive, despite constantly changing user test reporting. An important example is the replacement of MSC-designed reporting structures that would have helped the developers efficiently reproduce and resolve the issues.

It wasn't possible to analyze error correction rates quantitatively, since the methods and consistency of status reporting kept changing, there was almost no prioritization of requested fixes (until the go-live issues were defined in November '0x) and items were dropped for unknown reasons. However, it was clear from HMO's reports that MSC was reviewing and addressing the issues at a very reasonable rate for a company of its size, and attempting to resolve issues to suit HMO wherever possible.

An issue was raised that HMO was not an appropriate beta test site for MSC software, and didn't expect to be a beta site. This issue seems to be based on misunderstanding of the definition of a beta site. The term is used in the context of development of a product for distribution among a large number of customers. A select few customers volunteer to be early users, to get the advantage of the functionality at the cost of dealing with any software defects the manufacturer missed. These are the beta testers. In HMO's case, the software was a combination of the commercial product provided to MSC's general customer base, already beta tested, and custom software developed specifically to HMO's requirements – a market of one organization.

We were able to review many of the test reports produced by HMO. Of the 16 that seem to exist, we were able to obtain and review 12 of them, as shown in the Test Reports table. Results of the analysis are listed in the accompanying set of spreadsheets and described below. Note that the four missing reports were only referenced but were not made available for an unknown reason.

Test Reports Table

Date	Type	We've seen reference to:	Received & Reviewed:
7/18/0x	Functional		X
7/22/0y	Issues list		X
7/25/0x	Screen Shots		X
8/19/0x	?	X	
8/27/0x	Issues list		X
8/28/0x	?	X	
9/6/0x	?	X	
10/10/0x	Screen Shots		X
11/2/0x	?	X	
11/7/0x	Issues list		X
11/11/0x	Issues list		X
11/15/0x	Issues list		X
11/26/0x	Issues list		X
12/16/0x	Issues list		X
2/10/0y	Issues list		X
3/4/0y	Issues list		X

Functional Tests

When HMO contracted with MSC, they knew that Med-SW-Co was a small company. In order for the project to be successful, they needed to make the best use of MSC resources. One of these was a well-developed test procedure. This was introduced and used for the test report of 7/18/0x[8].

The first spreadsheet, "Functional Tests", summarizes the results of the single set of tests using MSC test methods. Tests 1, 2, 4-7, 9-11, 14-22, 24-27, 29, 40-42, 49, and 50 were run, generating a total of 134

issues to be analyzed by MSC and fixed if appropriate. The forms had a place to indicate relative importance of the issues, but none of them were marked.

However, there seems to be no further use of these issues or the MSC-supplied procedures after that. No documentation was found which show any subsequent use of the results from these tests. None of the other test reports we saw used that format, so there was no way to trace the MSC response and verify that the issues were resolved.

Instead, MSC was forced to adapt its small staff to HMO's procedures, which changed constantly.

Screen Shots

Two other basic methods of reporting were used. Simple versions were used at first, which evolved over time. One was a set of screen prints, marked up by hand. These were grouped by top level module only. Unless MSC received a much cleaner version, the backgrounds were almost impossible to read, so that determining the navigation path to that screen within the software must have been very difficult. None of the issues were prioritized.

It is important to note that screen-shots are not the same as issue descriptions. A screen-shot is only supporting data to an actionable issue. Also required is a complete description of the context, the testing which led to the defined problem, etc. In other words, all of the supporting information necessary to reproduce and resolve the issue thus identified, must be included. Just supplying a set of marked-up screen printouts is not sufficient and betrays a lack of professionalism on the part of the tester and their supervision.

The first set of screen prints we received was dated 7/25/0x[9]. On our spreadsheet labeled "Screen Shots" they are listed by document page number, since there isn't any other obvious way to label them. This set had 54 pictures of the computer screen, most with several changes written on them.

The second set of tests, dated 10/10/0x[10], had a more robust structure. In most cases the original marked-up specification screen predating the 7/25 test was included, as well as shots of the current version developed in response to those test results. The pages weren't in the same order as the 7/25 set, so MSC had the extra chore of leafing through the pages to check against the earlier updates. Also, in some cases the pages for the same test were separated and had to be assembled. There was no indication of which screens were accepted other than a lack of handwritten text – check marks were presumably approval, and question marks might or might not be significant. The individual screen shots are again labeled the document page number. We found updates for all but two of the 7/25 tests. There were another 54 sets of results as well, at least partly because additional software had been delivered in since the first tests.

Each screen usually had a number of modifications, so the low acceptance rate for screens doesn't indicate an unusually high error rate. Also, in some cases the rejections were of suggested alternate wording, rather than omissions or misspellings. There is no clear indication of whether all corrections were made and accepted after October 10. Item 204 on the issues list is supposed to reflect overall status, but is missing in the 12/16/0x and following reports.

Issues Lists

The third basic report format was a spreadsheet, one row per issue. This format evolved over time, suggesting that the HMO team was evolving their own test procedures from scratch.
The first version, the report of 7/22/0x from HMO[11], listed "Date of Test", "Sign On" (nurse or MD), and "Subcategory", as well as a free-form description of 43 issues. These issues weren't numbered or prioritized. They are listed in the first column of the "Issues List" spreadsheet. The numbers indicate their position in the spreadsheet with respect to later, numbered versions of the same issue.

The 8/27/0x update from HMO[12] added columns Issue Numbers, which nearly matched the order of the first version, "Fix Date", "Screen Name", "Response", "Category", "Follow-up", "User Response", and "Med-SW-Co Response", and an untitled column of undefined codes. A couple of issues had some indication of priority among other information in the User Response column. The Med-SW-Co Response

column had some indication of disposition – “Fixed”, “User”, or a cost estimate for enhancements. There wasn’t a clear indication of whether HMO accepted that disposition. Med-SW-Co dispositions for issues up to #70, those dated before 8/20/0x, included 9 cost estimates for enhancements, 21 “Fixed”, 11 “User”, 5 “Remove”, and 24 unassigned. One issue was missing from the spreadsheet altogether. The 8/20 issues brought the total up to 144.

The next report, 11/7/0x from HMO[13], is specific to the CBE applications. The spreadsheet no longer includes the Screen Name column or the unnamed one, but adds “Med-SW-Co Category” and “HMO Priority/Category”, with a set of suggested codes for them. It lists issues 268-337 only. The only columns used are Issue #, Sub Category (all CBE), and free-form description. This is the only version where supporting screen shots are attached, referenced to the issue numbers.

The 11/11/0x report[14] drops the “Med-SW-Co Category” and “HMO Priority/Category” columns, changes the old “Med-SW-Co Response” column to “Status”, and adds a new “Med-SW-Co Response” column in the middle. In addition, it breaks the spreadsheet into several lists – 156 Go Live Issues, 90 Closed-Not Bugs, 67 Closed-Fixed Bugs, (and one notable all-of-the-above), 17 post-Go Live Enhancements (“Later”), and 5 In Progress HMO (“HMO”). There are 28 issues that don’t appear on any list, for a total of 364. Item # 204 represents all the screen shots delivered to MSC on 11/10.

The 11/15/0x report[15] again includes “Med-SW-Co Category” and “HMO Priority/Category”; the codes are starting to be applied. It’s clear that at this point MSC believes that all issues through #196 are either closed or waiting for HMO’s decision or input, though HMO’s agreement isn’t usually clear. This report is no longer divided into a set of lists. Only one new issue has been added.

Remarkably, the 11/26/0x[16] report has the same columns as the previous report. Several more status codes have been added. There are no new issues. MSC is working on some that were previously listed as closed – so is HMO. CBE repairs are underway.

A short list of “In Progress HMO” issues of 12/16/0x[17] drops “Med-SW-Co Category” and “HMO Priority/Category” again, as well as plain “Category”.

The “Go Live” issues list of 2/10/0y[18] follows the same format. There are no new issues. There are also no updates in Status.

The 3/4/0y report[19] introduces completely new technology – the report appears to be generated by Access rather than Excel, which limits the number of people able to provide electronic updates (for better or worse). Most columns have been renamed, and they aren’t in simple column format any more. “Fix Date” seems to have been dropped. “Issue Date” is now “Date Entered”, “Issue #” is “Tracking No.”, “Type of Sign On” is “Signon Type”, “Sub Category” is “App. Area”, “Responsible Party” is “Owner”. “Status” got to keep the name it acquired in November. “Description”, “Screen Names” from back in August, “Med-SW-Co Response”, “Action Needed”, “User Response” and a new field “Action Notes” are strung together in a “Comment” section, preceded by a truncated copy of the description in the form of summary. There’s a new “Priority” (e.g. “Go-Live”), “Issue Type” (e.g. “bug”), “Component” (e. g. “Performance”), and “Patient Care” (e. g. “No”). This report was filtered on Issue Type “bug” and Owner “Med-SW-Co”. There appear to be at least 388 new issues since 2/10, though not all of them are attributed to MSC. Few of these new issues were documented as reviewed by MSC, though in a few cases it was noted that MSC had agreed to fix them.

Many assigned to MSC seemed more appropriate to be addressed first by someone at HMO -- "Is this acceptable to Medical Records?" or "possible internal issue". Some sound like wish list rather than the showstoppers one would expect at this stage -- "I would like..." or "it would be nice....". Others are minor formatting issues -- "left margin off by 1 space" or "redundant verbiage". The testers certainly weren't restricting themselves to making a final pass/fail decision.

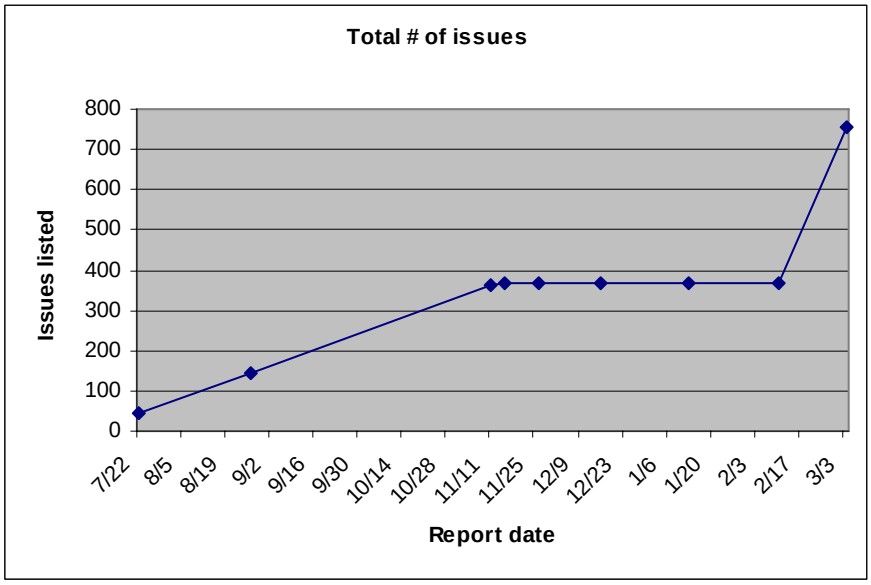
Rate of Issue Generation

Analysis of these lists provides some interesting information. The following table shows the number of new issues added at each report, and their classification, as precisely as could be determined.

Issues Disposition Table

Date	# new issues	Disposition											Total
		Un-known	Fixed	Closed	Closed-Not Bug	Enhance-ment	Open	Open-User	User Error	Open-Bug	Re-opened	Changed	
7/22/0x	43	1	16	1		6	13		7				44
8/27/0x	129	1	21	5		9	97		11				144
11/7/0x	70	267					70						337
11/11/0x	27	24	34		47	13	146	22	41			38	365
11/15/0x	1	18	34	20	47	15	124	27	41			40	366
11/26/0x	0	18	34	24	47	15	93	42	53			40	366
12/16/0x	2	123	34	24	47	15	26	6	53			40	368
1/13/0y	0	51	34	109	47	15	19		53			40	368
2/10/0y	0	44	34	108	47	15	26	1	53			40	368
3/4/0y	388	244	34	93	47	15	206		46	11	20	40	756

The number of new issues found follows a normal trajectory, with a sudden, unexplained explosion of new problems in the March 4 report, as shown in the following graph. The number of issues more than doubled again over the next few weeks, as determined from references to issue numbers in the 800's[20]. It should be noted that dozens of these issues were created in the few days before this report was released. Most of these last minute issues (2/28-3/04/0y) were created by RS and were labeled High-priority or Go-Live.



Disposition of Closed Issues

The second chart and the graph that follows it analyze the closed issues, comparing the number of fixes (MSC's fault) to the total of user errors, requested enhancements, and "non-bug" closed issues, and a third set of items that were closed without explanation. The latter may have been in dispute as to bug or not, or too unimportant to deal with -- or the project manager didn't bother to document them.

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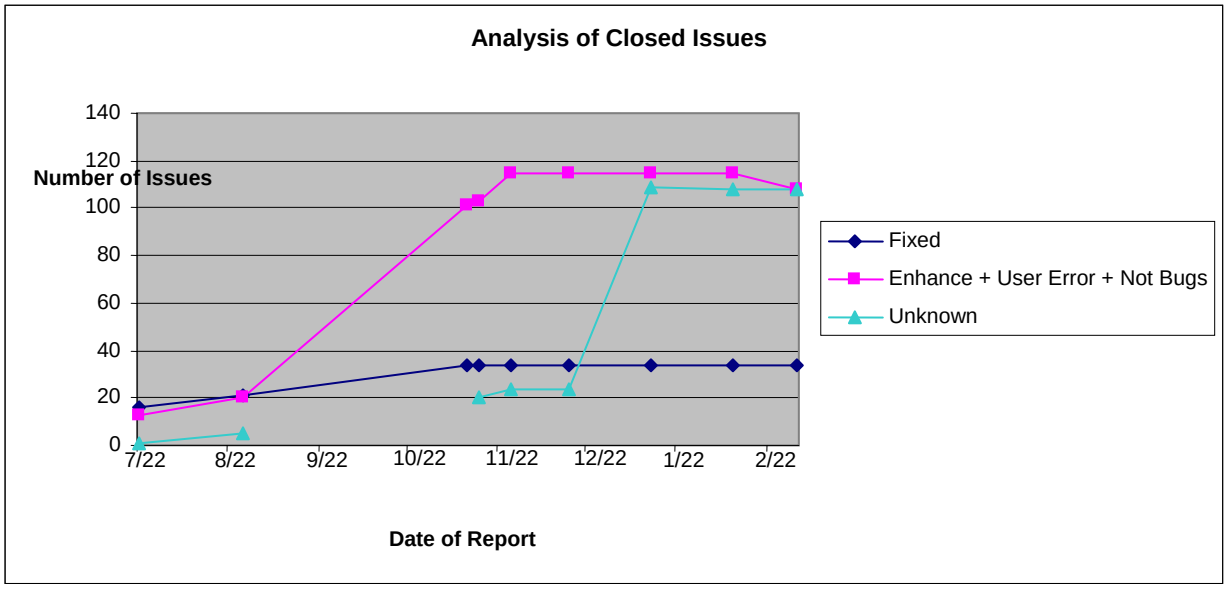
Closed Issues Table

Report Date	Fixed	Enhancements + User Errors + Not Bugs	Unknown
7/22/0x	16	13	1
8/27/0x	21	20	5
11/11/0x	34	101	
11/15/0x	34	103	20
11/26/0x	34	115	24
12/16/0x	34	115	24
1/13/0y	34	115	109
2/10/0y	34	115	108
3/4/0y	34	108	108



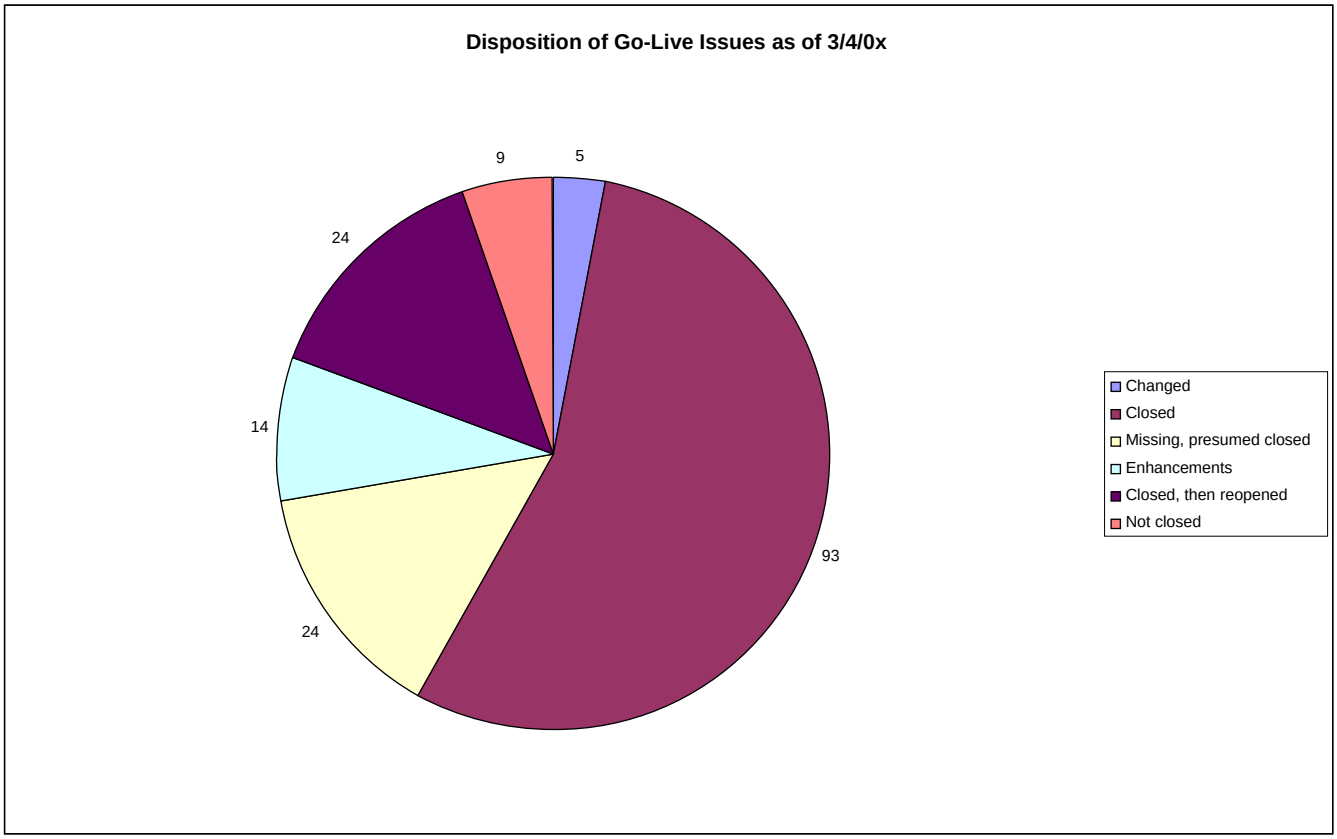
Fixes flat-lined in November when MSC lost access to the server.

Go-Live Issues

During November of 200x 167 issues in the lists were designated as requirements for the system to "go live", that is be resolved before the system can be put into production. Two more were added some time after the 11/26 report. The pie chart below shows what had happened to them by the beginning of March 200y. By the time of the 3/4/0y report, 93 of those issues had been closed. Five had been "changed"; apparently they were duplicates or had been merged with related issues. 24 were not listed in the report as either MSC open "bugs" or open "issues"; these had evidently either been closed or were currently the responsibility of the HMO team. Another 14 were agreed to be enhancements.

24 issues had been closed and then reopened in the 3/4 report. MSC agreed that 3 of those 24 were bugs; one was already fixed, one would be (a spelling error), and a third was fixed and waiting for access to the HMO server for final test. MSC needed clarification for one. The rest, if HMO really wanted the changes, would be enhancements beyond the scope of what had been agreed-upon.

A final 9 of the 167 were still open. Four of those would be enhancements; another needed clarification from HMO. HMO apparently didn't find any of them compelling enough to use in building their case for termination of the contract, as described in the next section.



12 Issues

Just before the contract termination letter was sent out at the end of April, HMO selected twelve issues to prove MSC's lack of responsiveness[21]. On inspection of these issues and of HMO's reports, they do not at all appear to represent issues that MSC refused or failed to address.

Five of them (#765, #783, #784, #809, and #811) were brand new issues -- defined some time after HMO's 3/4/0y report -- which was it-self barely a month old when these test cases were created.

#596 and part of another (#478) were first defined in the 3/4/0y report. The other part (#367) of this two-issue case first appeared in the 11/11 report, but was not classified as "go live" (i.e., important), and was missing in the 2/10 list of open issues, so presumably resolved to HMO's satisfaction. It reappeared in March. At that point, the issues list indicated that it was a question that needed to be addressed to HMO staff.

MSC documented closure of #269 and #306[22] in mid January of '0y. Either would be a change in the specification, thus an enhancement beyond what had been contracted. Both had been dropped from HMO's open issues list in December '0x, and then reopened later. MSC had suggested a way HMO could deal with the #269 issue, but agreed to fix it in the next version if that was unacceptable.

#211 and #274 had been identified as user errors in late November. Both were missing from the 12/16/0x list of open issues, but they were reopened later. #274 was still missing from the open issues list in February. In their re-analysis early in '0y, MSC pointed out that #211 was an agreed-upon user error, but indicated that #274 could be made an enhancement if HMO really wanted the change.

#274 was enhanced with a set of 9 new issues in the 800 range. It is hard to understand the benefit[23]; if these are all covered by the same set of documents explaining #274; the extra numbers would complicate tracking the problem. A possible purpose would be to maximize the number of "counts" against MSC and to overwhelm their ability to respond, in order to justify breaking the contract? If so, that concept might explain the sudden explosion

of issues between January and March. This is also consistent with the dozens of new issues created by the HMO senior staff (RS & JS) just before issuing the 3/04/0y report.

#173 still had a status of "$1,200" on the 2/10 list, which implies that HMO still hadn't given the go-ahead for development at that time. It was not included on the 3/4/0y list at all, so wasn't a MSC issue at that time either.

Some of the tests were executed by J. S. She does not seem to have the appropriate clinical background to be doing the evaluation.

In summary, all of these issues were new or had been revived within three months or just before the 4/15 report which raised them as the examples of MSC failure.

Cost of Customization

Analysis of HMO's issues lists demonstrates a much higher level of customization than called for in the contract. Even if HMO was justified in terminating the contract, which does not appear to be supportable, HMO demanded an excess of effort that should be paid for at MSC's hourly rate, as stated in the contract. According to HMO's Issue # 204, 79 screens were developed for this project. Conservatively assuming that each screen took ½ hour to review, design, program, test, and provide to HMO, the effort must have taken over 39 hours. This is already 9 hours over the contract.

HMO tested the software, and generated the list of issues which count well over 800. MSC can be assumed to have reviewed those in sequence and HMO has a response documented up to #378. Note that this is only the lowest number of the total that MSC might have reviewed before the large-scale, last-minute additions. Again, we can conservatively estimate half an hour to review each issue, reconstruct the sequence of events (though in many cases additional information had to be obtained from HMO, at an additional time cost), document it, respond to HMO, and manage this process. According to our analysis of closed issues (Closed Issues Table), only 24% of those closed for a specified reason were fixes of actual errors. Assuming that this is too generous an estimate, and half of the total issues were MSC's responsibility to fix (though normally such fixes would be part of the basic 30 hours). That is still half of 378, or 189 hours that MSC spent on excess work customizing the system for HMO.

Beyond that, were added delay costs because the promised specifications didn't exist when needed. These had to be built. Add to this excess communication efforts caused by the HMO handoffs between MSC and the system users. Finally, add the extra work and further inefficiency from cutting off access to the HMO server.

Altogether it appears that MSC was required to put in many times the work specified in the contract, only to have it terminated suddenly without reimbursement.

Report Preparation and Documents Reviewed

I was assisted by Dr. Margaret Chock in the research and preparation of this report. There were also extensive telephonic interviews with DM and BB of MSC. The following list includes most, but not all of the documents reviewed.

1. HMO v. Med-SW-Co pleadings and responses.
2. Product Licensing Agreement – between MSC & HMO 2/8/200x
3. Project timelines from both MSC and HMO
4. Test reports produced by HMO staff, and the MSC HMO Version 3.0 report
5. Depositions of GF, CK, et al.
6. Risk Assessment of JS
7. Expert Opinion of ES, PhD
8. Letters from Attorneys representing Med-SW-Co and HMO
9. MSC test materials developed for HMO
10. MSC testing training manual
11. Other documents listed in the footnotes **– Note: Footnotes have been redacted**.

Attachment

1. Set of MSC Test Statistics Spread-Sheets, M Chock

John Cosgrove, P.E.
Consulting Software Engineer

CC: Margaret Chock, PhD, MIBChock, LLC