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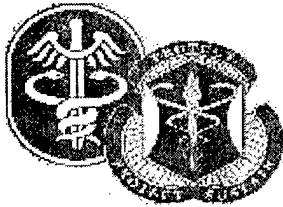
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# DHP RFS Final Report



VIRTUAL PRIMARY CARE CLINIC  
Proposal Number: 1999000231

Jerald WILLIAM Rumph MHA

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## Abstract

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## Problems

The problems, or challenges as I prefer to refer to them, can be fairly well encompassed within the concept of complexity. This was an ambitious project from the start, with potential to define an e-health direction for the region. It was perhaps this ambitious nature as well as a myriad of complex technical challenges to overcome that sensitized many personnel and departments. The project required discourse between various departments, each with their own agendas and priorities. It involved coordinating key MAMC Information Management functions, the MHS Information Management function of CHCS, SAIC at multiple levels, and many independent researchers in order to deliver patient care services in new ways, test new technology, and support clinical research. These challenges are in addition to those initially described in the mid-term report of internal project leadership definition.

This project was not only a new technology project, but also an information management systems intensive project. The proposal included both data push and data pull with CHCS. While the technology exists to accomplish both, the business processes that this impacts are significant. Thus, the goal of pushing data directly back into CHCS was sacrificed early on in the project to focus on the challenges of pulling data. This necessitated conversion from the hierarchical Mumps data structure of CHCS into a relational database (SQL2000) in order to present the data to the providers and patients over the Internet. A product used within the VA system, the Mumps Data Extractor, was selected but required modifications and upgrades for full functionality with CHCS. The coordination of this component alone required the interactions of the MHS Clinical Information Technology Program Office (CITPO), SAIC (corporate, DT&E, and on-site), and the MAMC Information Management Division. Probably not unexpectedly, various components of this process have required extensive attention in order to proceed.

Two additional challenges from the information management side were encountered.

First, the requirement to complete the DoD Information Technology Security Certification and Accreditation Process (DITSCAP) System Security Authorization Agreement (SSAA) was determined to apply to this project and to have mandatory compliance for all MAMC systems by August 2001. This process is not a simple one, has not previously been required at MAMC, and has challenged both the project personnel and the MAMC Information Security Office. The second additional challenge has been from the recent series of foreign government active Internet attacks that followed the downing of the aircraft in China. These have heightened overall DoD Internet security procedures, slowed development (which is primarily handled remotely via FTP), and resulted in a double log-in requirement for users of the site.

This project also is delivering health care in new ways for MAMC. As discussed further in the Final Results section, patients are provided secure internet messaging with their providers, results of medical care that were previously only available through direct contact with a provider, health information, and on-line health tools. Providers also have access to new tools with which to interact with their patients and new ways to view health data. The multiple components of these processes exceeded the complexity anticipated when initially proposed. Thus, the project scope is actually a great deal broader than first realized.

Support for research projects, identified as a key deliverable, has been successful; an initial approved proposal with eight subsequent proposals are pending final MRMC approval. This research component contributed its own dimension of complexity to this project. Most of the primary researchers on these proposals are novice researchers, the proposals had to be written without the benefit of a fully functioning site to serve as a model for functionality, and the projects required coordination both within and between departments and specialties. Full site delivery prior to proposal development would have facilitated research proposal development.

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## Deliverables

1. Functional virtual clinic for primary care patients at Madigan a. Appointing b. PCM Communication c. Results Review d. Health Information e. Personalized Health Tracking f. Secure g. Customizable

2. Data interface with CHCS a. Data pull b. Data push

3. Provider Support a. Patient schedules b. Healthcare Communication c. Triage d. Health status summary

4. Research a. Protocols b. Future

See also attached PDF Project Summary.

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## Expenditures

	3Q FY 00	4Q FY 00	1Q FY 01	2Q FY 01	
Element of Resource (EOR)	Apr 1 - May 31	Jun 1 - Sep 30	Oct 1 - Dec 31	Jan 1 - Mar 31	TOTALS
Travel 2100	0.00	0.00	0.00	1,200.00	1,200.00
Shipping 2200	0.00	0.00	0.00	0.00	0.00
Rent & Communications 2200	0.00	0.00	0.00	0.00	0.00
Contract for Services 2500	0.00	279,051.00	0.00	0.00	279,051.00
Supplies 2600	0.00	5,000.00	2,572.66	776.53	8,349.19
Equipment 3100	0.00	16,000.00	0.00	0.00	16,000.00
<b>GRAND TOTALS</b>	<b>0.00</b>	<b>300,051.00</b>	<b>2,572.66</b>	<b>1,976.53</b>	<b>304,600.19</b>

## Financials

Primary development for the site was through a Firm Fixed Price (FFP) contract with Akimeka (teamed with Pacific Health Solutions, Strategic Reporting Systems, and Microsoft). This \$279,051 contract has been modified with respect to delivery dates, primarily related to the challenges encountered with the CHCS data extraction tool and approvals. Cost has remained fixed and the contractor has extended, at no additional cost, the on-site half-time research support/technical assistant for two additional months. This represents an excellent value as initial proposals by other vendors against this projects SOW ranged to upwards of \$1,000,000.

The anticipated cost to maintain this system with its delivered functionality is approximately \$30,000 per year, which would pay for a half-time research/technical assistant. The funds remaining within the budget at present, approximately \$18,000 will be primarily used to extend this support for an additional 7 months.

## Final Results

**PATIENT SITE:** This project has successfully deployed an internet based virtual clinic that supports patient access to care 24 hours per day, seven days per week. The fully functional site automates many time-consuming processes involved in healthcare delivery by enabling and encouraging patients to be active participants in their own treatment. Patients are able to book and review appointments on-line. Patients are now able to communicate with their primary care manager asynchronously allowing for improved communication efficiency for both parties involved. Patients can review their medications, laboratory and radiology results, and other health information provided by their healthcare team. Patients can search for on-line information prior to communicating with their provider via the Healthwise Knowledgebase. This, combined with tools for tracking health behaviors, encourages patients to take an active role in their care. Patients communicate with their team through secure, webpage posting. Patients can customize their own home page to present the information that they want to see when they log-in to the site and to then work with that information in the manner they find most beneficial.

**DATA INTERFACE:** This project has overcome many challenges from both the technology side and the business process side. It has successfully pulled data from CHCS for presentation to patients and providers. We executed a measured decision not to pursue the data push option having engaged in greater than expected challenges with the data pull. We are able to take the CHCS mumps data and convert it directly to a SQL2000 relational structure for presentation via our secure website.

**PROVIDER SUPPORT:** The virtual clinic supports providers in their delivery of healthcare as well as the patients. Providers are able to review in one location their patients schedules for the day and with a single mouse click drill down to the individual patient information. The initial patient view offers a summary of health information about the patient and also support extended views. Providers may also view and print the patient's Form 2766. In addition to viewing the patients CHCS data the site also supports the review of patient completed Triage Forms, On-line Questionnaires and Surveys, and Health Status Summaries. Providers can communicate asynchronously with their patients allowing them to convey health information securely without having to repeatedly attempt to call patients.

**SCALABILITY:** This project has been designed to support up to 20,000 users. One of the indirect outcomes of this project will be an assessment of the level of interest expressed by patients. While a previous study that we conducted here suggested that as many as 60% of users would be interested we are anticipating a potential 25% interest level. The level of interest is not seen as a static measure, however, as we anticipate growing demand as internet usage and comfort continues to grow.

**RESEARCH:** This project has supported eight formal research protocols. These protocols touch on a range of important clinical and business areas for the AMEDD. Three of the projects focus primarily on business processes. One resident led protocol compares electronic consultation with telephone consultation. This project's hypothesis is that use of the internet for electronic communication (secure messaging) will improve patient and provider satisfaction and decrease demands for office visits as compared to traditional office visits and phone contact. A second, nurse led protocol, explores the concept of Demand Management with the hypotheses that regular electronic communication that includes content reflecting the concern for patient health and health promotion information will decrease medical system utilization frequency for patients

identified as frequent medical system users, that nursing staff can appropriately implement this procedure, and that the workload requirements for nursing staff to implement this process will be more than offset by the decreased medical system utilization by patients. A third project is being conducted jointly with Foundation Health, the Region's TRICARE contractor, comparing the "costs" for electronic appointing versus telephone appointing.

The other protocols have a more clinical focus. One resident led protocol is focused on hypertension with the hypotheses that the use of internet technology to provide personalized patient education and delivery of information between provider and patient will improve blood pressure control when compared with current clinic practice of managing hypertension. Another resident led protocol targets hyperlipidemia with the hypothesis that using Internet technology to provide personalized patient education and delivery of information between provider and patient will improve lipid control to meet the Adult Treatment Panel (ATPII) and National Cholesterol Education Program (NCEP) guidelines for secondary prevention when compared with current clinic practice of managing hyperlipidemia.

Two other protocols are headed up by Nurse Practitioners. The first looks at diabetes control, with the hypothesis that regular contact through electronic communication that includes health promoting content and provides personalized patient education and delivery of information between health care provider and patient will improve glycemic control and positively impact Health Locus of Control, Self-care agency and Health Promoting behaviors in adult patients with Type 2 Diabetes when compared to adult patients with Type 2 Diabetes without access. The second targets chronic pain with the hypothesis that regular electronic communication that includes content reflecting concern for patient health, cognitive behavioral therapy, medication, exercise, lifestyle, complimentary/non-traditional health care and health promotion information will decrease medical system utilization, decrease cost, and improve patient reported pain symptoms compared to a control group receiving standard care.

Finally, psychologists are exploring the use of virtual care for depression and the overall impact of this project (to include research) on clinic functioning. The depression project hypothesizes that regular electronic communication between the primary care provider and patients with depression that includes content reflecting the concern for patient health, supportive psychotherapy, medication, exercise, lifestyle, and health promotion information will decrease medical utilization and cost and improve patient outcomes when compared to a control group receiving standard care, and that primary care providers, to include nurse practitioners and physicians, can appropriately provide this treatment when collaboratively supported by a clinical psychologist. The comprehensive/overview project evaluates the virtual care impact upon primary care business practices as measured by compliance with clinic policies, patient care follow-up, patient education, and workload accounting.

The research protocols outlined above represent only a small number of the possible research opportunities that may ensue as a result of this e-health initiative. The design of this project not only allows research to exist on this platform, but is specifically constructed to support research initiatives. The site allows dynamic creation of new questionnaires and forms that can be completed by patients on-line. The site also supports integrated research study enrollment and participant management.

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## Projected Costs

This project was developed with the standard that it be able to support 20,000 users. The data pull from CHCS is presently designed for pulling all patient data for all patients supported by this CHCS host, a region that is not the entirety of Region 11, but does include all of MAMC, McChord, Bremerton, Oak Harbor, and other geographically related areas within the Northwest. The cost and complexity for wide scale deployment would presumably require a part-time research/technical assistant at each site to assist both patients and providers in bringing the system to functioning. Following an initial year of that dispersed support the support may be able to be localized to a single support person at MAMC.

Estimated costs for an extended application to other hospitals, clinics, or the Army overall may be in the range of \$100,000 per location. Anticipated costs would be license fees and engineering for site customization. Additional features to include amplified data views and documentation that would be desired for an AMEDD wide solution may add up to \$300,000.

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## Comments

The funding for telemedicine research has offered an opportunity for investigators, such as myself, to pursue areas of exploration that would otherwise not be available. The awarding of funds to the PI to pursue the research has allowed this, and other projects with which I am involved, to proceed without some of the time and process delays associated with "acquisition" projects while maintaining a single responsible individual for the project. It would be optimal if the funding could be made available earlier in the fiscal year, or if it could be dispersed as two-year funding, but this type of issue is not unique to this program.

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## TATRC Scientific Review

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## TATRC Acquisition Review

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# Supporting Graphs/Charts

See Attached









ID	Task Name	3rd Quarter			4th Quarter			1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			2nd Quarter		
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
218	3.6.3. History Questionnaire	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
219	3.6.4. Clinic Information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
220	3.6.5. Hospital Directory-Maps, Parking Recomir	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221	3.6.6. TRICARE Link	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
222	<b>3.6.7. Patient Education</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
223	3.6.7.1. Link to the HealthyWise Handbook	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
224	3.6.7.2. Discharge Education Information (C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
225	3.6.7.3. The Primary Care Newsletter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
226	3.6.7.4. Nutrition Facts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
227	3.6.7.5. Fitness Facts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
228	3.6.7.6. Wellness and Prevention	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
229	3.6.7.7. List Patient Education Classes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
230	3.6.7.8. Integrate the Existing MAMC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
231	3.6.7.9. Provide Links at Appropriate Locat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
232	3.6.8. Employment Opportunities Throughout M/A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
233	3.6.9. Patient Representative Link-Email Functio	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
234	<b>3.6.10. Provider Page</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
235	3.6.10.1. Provides Standard Formats and N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
236	3.6.10.2. Allows Secure Email Communicat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
237	3.6.10.3. Modify and Send Discharge/Treat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
238	<b>3.6.11. User Tracking System (Patient and</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
239	3.6.11.1. System to Verify and Measure Us	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
240	3.6.11.2. Reporting System for Use, Time o	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
241	<b>4.0 Legacy System Interface Requirements</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
242	4.1. CHCS Research	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
243	<b>4.2. Data Pull Required From CHCS</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
244	4.2.1. Appointment Data-Pending	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
245	4.2.2. Appointment Data-Open Appointment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
246	4.2.3. Medications-Current	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
247	4.2.4. Medication - Past	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
248	4.2.5. Laboratory Results - Current	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
249	4.2.6. Laboratory Results - Past	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
250	4.2.7. Radiology Results	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
251	4.2.8. Master Problem List	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
252	4.2.9. Allergies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
253	<b>4.3. Data Push (Modified to Work Arounds,</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
262	<b>DI/SCAP</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
263	Development System Approval	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
264	Initial Approval to Operate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
265	Final SSAA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
266	Testing/Integration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
267	Post Deployment Support	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
268	Official Kick-off	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

