AdaNet Research Plan

John McBride

SofTech, Inc.

(NASA-CR-187262) AdaNet RESEARCH PLAN
(Houston Univ.) 66 p

Cooperative Agreement NCC 9-16
Research Activity IM.14

NASA Johnson Space Center
NASA Technology Utilization Program

Research Institute for Computing and Information Systems
University of Houston - Clear Lake

T·E·C·H·N·I·C·A·L· R·E·P·O·R·T
The University of Houston-Clear Lake established the Research Institute for Computing and Information systems in 1986 to encourage NASA Johnson Space Center and local industry to actively support research in the computing and information sciences. As part of this endeavor, UH-Clear Lake proposed a partnership with JSC to jointly define and manage an integrated program of research in advanced data processing technology needed for JSC's main missions, including administrative, engineering and science responsibilities. JSC agreed and entered into a three-year cooperative agreement with UH-Clear Lake beginning in May, 1986, to jointly plan and execute such research through RICIS. Additionally, under Cooperative Agreement NCC 9-16, computing and educational facilities are shared by the two institutions to conduct the research.

The mission of RICIS is to conduct, coordinate and disseminate research on computing and information systems among researchers, sponsors and users from UH-Clear Lake, NASA/JSC, and other research organizations. Within UH-Clear Lake, the mission is being implemented through interdisciplinary involvement of faculty and students from each of the four schools: Business, Education, Human Sciences and Humanities, and Natural and Applied Sciences.

Other research organizations are involved via the "gateway" concept. UH-Clear Lake establishes relationships with other universities and research organizations, having common research interests, to provide additional sources of expertise to conduct needed research.

A major role of RICIS is to find the best match of sponsors, researchers and research objectives to advance knowledge in the computing and information sciences. Working jointly with NASA/JSC, RICIS advises on research needs, recommends principals for conducting the research, provides technical and administrative support to coordinate the research, and integrates technical results into the cooperative goals of UH-Clear Lake and NASA/JSC.
AdaNET Research Plan
Preface

This research was conducted under the auspices of the Research Institute for Computing and Information Systems by John McBride, of SofTech, Inc. Dr. Peter C. Bishop, Director of the Space Business Research Center, served as RICIS technical representative for this activity.

Funding has been provided by the NASA Technology Utilization Program, NASA/JSC through Cooperative Agreement NCC 9-16 between NASA Johnson Space Center and the University of Houston-Clear Lake. The NASA technical monitor for this activity was Robert B. MacDonald, Assistant to the Director for Technology Utilization, Mission Support Directorate, NASA/JSC.

The views and conclusions contained in this report are those of the author and should not be interpreted as representative of the official policies, either express or implied, of NASA or the United States Government.
AdaNET
Research Plan

May 1, 1990
Contract IM.14

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SOFTech

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AdaNET Research Plan

1. Introduction

1.1. Purpose

This project plan specifies the goals, activities and resources necessary to support the research of the AdaNET system. It will serve as the guiding document to control the overall research effort.

1.2. AdaNET Research Mission

The mission of the AdaNET research effort is to determine how to increase the availability of reusable Ada components and associated software engineering technology to both private and Federal sectors. The effort is structured to define the requirements for transfer of Federally developed software technology, study feasible approaches to meeting the requirements, and to gain operational experience in applying various technologies and practices.

1.3. Organization of Document

Section 2 presents the overall approach to the development of the AdaNET System Specification. Section 3 presents a work breakdown structure with each research activity described in detail. Section 4 summarizes the deliverables for each work area. Section 5 describes the overall organization and responsibilities for each research area. Section 6 presents the schedule and necessary resources for each research activity. Section 7 summarizes the estimated cost for each activity. The project plan is fully described in the Super Project Expert data file contained on the floppy disk attached to the back cover of this plan.
2. **Approach**

The strategy to develop the AdaNET specification is driven by the philosophy of iterative prototyping development that includes activities of requirements definition, development, operations and evaluation. The overall effort is represented in Figure 2-1. This figure illustrates the management, research and review activities necessary to produce the AdaNET Research Results. The management activity uses the Project Plan to provide technical direction which aids in the development of various research products during the AdaNET Research activity. These research products are reviewed to provide management with visibility into the research effort and to provide the research team with feedback to facilitate their efforts.

Figure 2-2, Provide AdaNET Research, represents the activities in box two of Figure 1. The principle activities are divided into four work areas. Each work area can proceed as soon as necessary input information becomes available. While some activities do depend upon some results of other activities to carry out the full range of tasks, each activity can begin its research immediately. With feedback from evaluation activities, each of the work areas continues to iterate on new information. The primary activities and products of each work area are described below, while detailed work breakdown structure with task descriptions is discussed in Section 3.

### 2.1. Develop Requirements Definition

This activity describes what services and products AdaNET should provide by

- refining the concept of the AdaNET mission
- identifying potential users, sources of reusable software, reuse methodologies and potential application domains
- developing a set of user requirements
- understanding the legal implications of software reuse

This information will be acquired through market surveys and coordinating with related reuse activities in other organizations, including RAPID, COSMIC, Space Station Freedom Software Support Environment, STARS, as well as various corporate initiatives.

The major products of this activity include:

- AdaNET Market Survey
- AdaNET Mission Concept Document
- AdaNET User Requirements Document
- The Legal Implications of Reuse Study
Figure 2-1 Implement AdaNET Research Plan

Figure 2-2 Provide AdaNET Research Plan
2.2. Analyze Requirements and Develop System

This activity consists of two major thrusts. The first is to analyze the requirements to determine feasibility, benefits and cost and to recommend specific enhancements to the research system. Secondly, this activity includes the development of all software components, policies and procedures to support the operation of the research system. The major products of this activity include:

Trade Studies - Several short studies of various implementation alternatives shall be conducted to support analysis and development.

Research System Enhancements - These represent the upgrades to the current system and other operational prototype capabilities used to assess the overall support strategies and facilities for software technology transfer. The principle focus of these enhancements is to provide a research platform to address specific reuse issues.

System Requirements - This document describes the desired functional capabilities of AdaNET based on the research findings of this effort. It includes the AdaNET mission, operational concept, and operational sequence diagrams, and an information schema.

System Specification - This document specifies the system's functional and performance requirements necessary to support the system requirements. It shall also include characteristics such as reliability, maintainability, availability, and functional allocation quality assurance factors.

Rejected Requirements - This is a report that summarizes the many requirements that were considered as part of this research effort but were not included in the System Requirements document. Each rejected requirement and a rationale for rejection shall be enumerated.

2.3. Operate Research System

Operational activities provide support to the AdaNET users and collect certain usage data for subsequent evaluation. These activities include:

- maintaining the AdaNET information including information on conferences, contracts, news, products, publications, references and training, reusable software components, and information in hardcopy form,
- supporting users by registering new users, distributing output requests, problem solving, updating user guides, attending conferences to promote project interaction with potential users, and operating a software engineer's help desk,
- maintaining the AdaNET system through hardware and software upgrades and operating the research system and telecommunications equipment.

The major products of this activity are operational usage results and AdaNET products distributed to its users.
2.4. Evaluate Research System

This activity includes coordination with the aforementioned activities to evaluate:

- the degree to which the research prototype supports the current requirements,
- existing products and services on their quality, utility, accessibility, client satisfaction and efficiency,
- the degree to which the AdaNET products and services are reaching the appropriate clients.

This activity will produce research reports evaluating AdaNET features.
3. Work Breakdown Structure and Task Descriptions

Table 3-1 provides the project level AdaNET Research tasks, their descriptions, resources and associated work breakdown (WBS) code.
<table>
<thead>
<tr>
<th>Heading/Task Resource</th>
<th>Description/Note Text</th>
<th>WBS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADANET</strong></td>
<td><strong>Project Office</strong></td>
<td>0.0.0.0.000</td>
</tr>
<tr>
<td></td>
<td><strong>Management</strong></td>
<td>1.0.0.0.000</td>
</tr>
<tr>
<td></td>
<td><strong>Research Activity Management</strong></td>
<td>1.1.0.0.000</td>
</tr>
<tr>
<td></td>
<td>The UHCL AdaNet Project Manager will provide support to AdaNet by:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Supervising AdaNet Project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Coordinating with related activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Preparing briefings &amp; presentations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Reporting Status to NASA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Attending Conferences &amp; Seminars on related topics</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>UHCL AE Program Mgmt.</strong></td>
<td>1.1.2.0.003</td>
</tr>
<tr>
<td></td>
<td><strong>MTN Technical Mgmt</strong></td>
<td>1.1.3.0.004</td>
</tr>
<tr>
<td></td>
<td>The Technical Director is responsible for monitoring the technical performance on the contract, providing technical direction, promoting team communication, and recommending plan adjustments.</td>
<td></td>
</tr>
<tr>
<td><strong>SofTech Data Management</strong></td>
<td><strong>Data Manager</strong></td>
<td>1.1.4.0.005</td>
</tr>
<tr>
<td></td>
<td>The Data Manager shall be responsible for establishing a filing system for project deliverables and supporting reference material for the AdaNet effort and entering those data items into the AdaNet Project Library according to the filing system. The DM will update the documents and other material as changes are received, assure that all library entries are updated as approved changes are received, and distribute the current list of library contents to AdaNet project members. There will be complete physical collections in Houston and West Virginia.</td>
<td></td>
</tr>
<tr>
<td><strong>TFB Support</strong></td>
<td><strong>Meetings &amp; Reviews</strong></td>
<td>1.2.0.0.000</td>
</tr>
<tr>
<td></td>
<td>Project Reviews</td>
<td>1.2.2.0.000</td>
</tr>
<tr>
<td></td>
<td>Review progress with UHCL and NASA/JSC. Develop and approve policy, approve new elements and research, (Configuration Control Board Activities), receive deliverables and research. Meetings will be held monthly. Attendees shall include RICIS project monitor, JSC monitor, RICIS Director, MountainNet Program Manager and AdaNet Technical Director. Meetings will be held in UV once per quarter and Houston at other times.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>MTN</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SofTech</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>GNG</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NASA Reviews</strong></td>
<td>Meetings shall be held quarterly to review progress with NASA ROI TU in Washington, D.C. Attendees shall include JSC Monitor, RICIS Project Monitor, MountainNet Program Manager and Technical Director.</td>
<td>1.2.1.2.008</td>
</tr>
<tr>
<td></td>
<td><strong>SofTech</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>MTN</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>GNG</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Advisory Group</strong></td>
<td>Meet with UHCL convened advisory group to present AdaNet research. Plan to meet semi-annually for one day.</td>
<td>1.2.1.3.009</td>
</tr>
<tr>
<td></td>
<td><strong>MTN</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SofTech</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Task Resource Table

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description/Note Text</th>
<th>UBS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG Adv. Grp.</td>
<td></td>
<td>1.2.2.0.000</td>
</tr>
<tr>
<td>Conferences</td>
<td></td>
<td>1.2.1.011</td>
</tr>
<tr>
<td>Triada 90</td>
<td></td>
<td>1.2.2.2.012</td>
</tr>
<tr>
<td>MTN SoffTech GHG UNCL</td>
<td></td>
<td>1.2.2.3.013</td>
</tr>
<tr>
<td>General Conference</td>
<td></td>
<td>1.2.3.0.014</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td>1.2.4.0.015</td>
</tr>
</tbody>
</table>

### Other Direct Costs

The estimates of Other Direct Costs in the Project Office Plan are as follows:

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Dues &amp; Fees</td>
<td>$200</td>
<td>$200</td>
</tr>
<tr>
<td>Xerography, Printing</td>
<td>1,200</td>
<td>1,200</td>
</tr>
<tr>
<td>Postage, Shipping</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Telephone Equip. &amp; Long Dist.</td>
<td>2,400</td>
<td>2,400</td>
</tr>
<tr>
<td>Office Supplies</td>
<td>1,527</td>
<td>2,300</td>
</tr>
<tr>
<td>Books, Subscriptions</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Total estimated ODC-Proj. Office</td>
<td>$6,227</td>
<td>$7,000</td>
</tr>
</tbody>
</table>

The equipment purchase anticipated for the Project Office is the following:

- S2 80386 or equivalent
- Personal Page II Laser printer or equivalent

The breakdown of ODC expenses estimated for Allied Expertise's entry into the plan are as follows:

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Fees</td>
<td>$3,244</td>
<td>$3,244</td>
</tr>
<tr>
<td>Meeting Costs</td>
<td>1,208</td>
<td>1,208</td>
</tr>
<tr>
<td>ADPE</td>
<td>5,408</td>
<td>5,408</td>
</tr>
<tr>
<td>Total ODCs for Applied Expertise</td>
<td>$9,950</td>
<td>$9,950</td>
</tr>
</tbody>
</table>

The equipment and software to be provided by the UNCL to support Sofftech on UBS 1.2.4 is the following:

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Function</th>
<th>Qty</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>S28 80386 or equivalent</td>
<td>Project Management</td>
<td>1</td>
<td>$5000</td>
</tr>
<tr>
<td>Mac II</td>
<td>Office workstation and CASE support</td>
<td>5</td>
<td>38500</td>
</tr>
<tr>
<td>Laser printer</td>
<td>Printer for IBM and Macs</td>
<td>2</td>
<td>3000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>$46500</td>
</tr>
<tr>
<td>Software</td>
<td>Application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word</td>
<td>Word Processing</td>
<td>1</td>
<td>$400</td>
</tr>
<tr>
<td>Heading/Task</td>
<td>Resource</td>
<td>Description/Note Text</td>
<td>WBS Code</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>-----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>SuperProject</td>
<td>Expert</td>
<td>Project Management</td>
<td>1 600</td>
</tr>
<tr>
<td>ProcComm Plus</td>
<td>Modem Communications</td>
<td>1 60</td>
<td></td>
</tr>
<tr>
<td>Quattro Pro</td>
<td>Spreadsheet</td>
<td>1 300</td>
<td></td>
</tr>
<tr>
<td>RAF</td>
<td>Network to VAX for backup, data exchange</td>
<td>1 500</td>
<td></td>
</tr>
<tr>
<td>Mac</td>
<td>Virus prevention, file recovery</td>
<td>5 900</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>Functional/data modeling</td>
<td>1 3000</td>
<td></td>
</tr>
<tr>
<td>Design/IDEF</td>
<td>Entity-Relation modeling</td>
<td>1 1000</td>
<td></td>
</tr>
<tr>
<td>DataSculptor</td>
<td>Bit-mapped graphics</td>
<td>5 750</td>
<td></td>
</tr>
<tr>
<td>SuperPaint</td>
<td>Object-oriented graphics</td>
<td>5 1450</td>
<td></td>
</tr>
<tr>
<td>MacDraw</td>
<td>PERT Chart graphics</td>
<td>1 370</td>
<td></td>
</tr>
<tr>
<td>Mac2400</td>
<td>MicroVAX connectivity</td>
<td>5 1000</td>
<td></td>
</tr>
<tr>
<td>PowerPoint</td>
<td>Presentation production</td>
<td>5 1200</td>
<td></td>
</tr>
<tr>
<td>Excel</td>
<td>Word processing</td>
<td>5 1200</td>
<td></td>
</tr>
<tr>
<td>Word</td>
<td>Network Software</td>
<td>5 1250</td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td>Screen saver</td>
<td>5 75</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td></td>
<td></td>
<td><strong>Subtotal</strong> $14535</td>
</tr>
<tr>
<td>Total GDC (Hardware and Software)</td>
<td></td>
<td></td>
<td><strong>$61035</strong></td>
</tr>
</tbody>
</table>

**Requirements**

**Requirements Definition**

2.0.0.0.000

**MTM**
SofTech
UNSCL
CHG
AE

**Market Survey Plan**

A Market Study will be performed to help identify potential AdaNet users, contributors to the AdaNet Library and candidate application domains for the AdaNet population. The market survey will be performed with respect to the potential number of users, usability of the domain, their likelihood of using Ada in the near future, and the potential of AdaNet's commercial applicability. The user requirements for an on-line service and their willingness to pay for these services will be evaluated. In addition, the similar on-line information retrieval systems and reuse methodologies will be identified and studied.

2.1.0.0.018

**Market Survey Plan**

A short planning phase will detail the survey questions and procedures to identify a preliminary target population in a "AdaNet Market Survey Plan." The target population includes potential AdaNet users, contributors, and related reuse efforts. A partial listing of members of the target population have already been identified. Market Survey Target Population is:

- NASA CCMII
- NASA GSFC
- NASA JPL
- NASA SSO
- NASA SSCI
- NASA JSC
- FedLib Dep Prg

**GNP**

JStaples

2.1.2.0.019

**M/Market Survey Plan**

Milestone: Market Survey Plan Deliver

2.1.3.0.020

**Survey Plan Rev.**

Survey PLAN Review

2.1.4.0.021

**GNP**

Market Survey
This includes personal and telephone interviews of the...
<table>
<thead>
<tr>
<th>Heading/Task</th>
<th>Resource</th>
<th>Description/Note Text</th>
<th>WBS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG</td>
<td>Dyer/FA</td>
<td><strong>Market Study</strong> AdA Net Marketing Survey</td>
<td>2.1.6.0.023</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The final phase of the Market Study entails the analysis of the survey data and culminates in a report called AdA Net Market Survey.</td>
<td></td>
</tr>
<tr>
<td>GHG</td>
<td>JStaples</td>
<td><strong>Mission Definiti</strong> Produce Mission Concept does</td>
<td>2.2.0.0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The contractor shall define a new AdA Net Statement of Mission in a brief concept document. The current AdA Net mission, system, and requirements shall be analyzed with regard to the important role the AdA Net system can play in uniting the resources of the NASA Office of Technology Utilization and other similar government agencies. The AdA Net approach to promoting the utilization of government technology by providing information, reusable products, and services via an on-line system shall be presented. If the role of AdA Net is broadened, a new name shall be suggested for the AdA Net system.</td>
<td></td>
</tr>
<tr>
<td>Analysis Definiti</td>
<td></td>
<td><strong>Analysis Definition</strong></td>
<td>2.2.1.0.027</td>
</tr>
<tr>
<td></td>
<td>GNG</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SofTech</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dyer/FA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mission Concept</td>
<td></td>
<td><strong>Mission Concept</strong></td>
<td>2.2.2.0.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Current AdA Net documents will be collected and the statement of mission, system, and requirements will be analyzed. The original authors of the AdA Net documents will be available as consultants to assist in this analysis. AdA Net Management from NASA and RICIS will play an integral role in defining the AdA Net mission and defining the AdA Net System Concept that can accomplish that mission.</td>
<td></td>
</tr>
<tr>
<td>GNG</td>
<td>SofTech</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dyer/FA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K/Pre Concept Doc</td>
<td>Milestone: Preliminary Mission Concept Document</td>
<td>2.2.3.0.029</td>
<td></td>
</tr>
<tr>
<td>K/Fin Concept Doc</td>
<td>Milestone: Final Mission Concept Document</td>
<td>2.2.4.0.030</td>
<td></td>
</tr>
<tr>
<td>Concept Doc Rev</td>
<td>Concept Document Review</td>
<td>2.2.5.0.031</td>
<td></td>
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<td>GHG</td>
<td>SofTech</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Dyer/FA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Req. Defi</td>
<td>User Requirements Definition</td>
<td>2.3.0.0.000</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>The contractor shall generate a requirements document that contains the functional requirements for an on-line information resource that most effectively promotes the transfer of technology as outlined in the AdA Net Mission Concept Document.</td>
<td></td>
</tr>
<tr>
<td>User Req. Doc.</td>
<td>User Requirements Document</td>
<td>2.3.1.0.033</td>
<td></td>
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<tr>
<td></td>
<td>Requirements for the AdA Net system will be gathered from several sources. These include the existing AdA Net system</td>
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<tr>
<td>Heading/Task Resource</td>
<td>Description/Note Text</td>
<td>WBS Code</td>
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<tr>
<td>requirements, RAPID, STARS, and other similar development efforts. Current AdaNet users, and other users of on-line information retrieval systems may be surveyed and their requirements evaluated. This document will be delivered to the AdaNet Development Team in two phases for requirements analysis. The AdaNet Preliminary User Requirements Document will be delivered as soon as possible to the Development Team so that they may begin selecting a suitable AdaNet Research System to use for further research. A subset of the AdaNet System Requirements will then be selected for testing via the Research System. GHG will utilize similar documentation standards and procedures and will employ a consultant form the AdaNet Development Team to smooth the transition between the Requirements Team to the Development Team.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>N/Prel User Req Milestone: Prel User Require. Doc</td>
<td>2.3.2.0.034</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>N/Final User Req Milestone: User Require. Document</td>
<td>2.3.3.0.035</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>User Req Doc Rev</td>
<td>2.3.4.0.036</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>Refine Req. Doc. Refine Requirements Document</td>
<td>2.3.5.0.037</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>Coord/Coord User Groups Coordinate with User Groups</td>
<td>2.4.0.0.000</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>Estab SIGs/Reuse Special Interest Groups on Reuse Various organizations interested in software reuse will be organized to form a Special Interest Group which can facilitate the transfer of relevant information. This group will mainly consist of reuse facility managers from their respective organizations. Specific attention will be placed on the Clear Lake software development community. Candidate organizations are:</td>
<td>2.4.1.0.039</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>SIG Mtgs. &amp; Rev. GHG personnel will attend meetings, reviews, and obtain pertinent documents on behalf of the AdaNet project. GHG will identify areas of commonality, reuse, and applicable technologies, and will facilitate the transfer and sharing of this information between the AdaNet Project and the interest groups.</td>
<td>2.4.2.0.040</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>SIG Liaison</td>
<td>2.4.3.0.041</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>Prod. legal report Produce Legal Report The contractor shall support and participate in a legal study; this study will produce a review of the legal implications of software and technology reuse.</td>
<td>2.5.0.0.000</td>
<td></td>
</tr>
<tr>
<td>GHG SoftTech Dyer/FA</td>
<td>Legal Review</td>
<td>2.5.1.0.043</td>
<td></td>
</tr>
<tr>
<td>Heading/Tasks</td>
<td>Resource</td>
<td>Description/Note Text</td>
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</tr>
<tr>
<td>Legal/LegCon</td>
<td>Legal Study Doc</td>
<td>A review of legal documents will be conducted. The review will include laws relevant to U.S. Copyright Law, patents, FAR regulations, intellectual property rights, liability, maintenance of reusable items, warranties, and guarantees. An extensive bibliography will be included. NASA and other legal council may be consulted as required.</td>
<td></td>
</tr>
<tr>
<td>Legal/LegCon</td>
<td>Require. Agent</td>
<td>Project direction, cost accounting, projections, scheduling.</td>
<td></td>
</tr>
<tr>
<td>Legal/LegCon</td>
<td>Require. Travel</td>
<td>Travel associated with requirements definition.</td>
<td></td>
</tr>
<tr>
<td>Legal/LegCon</td>
<td>Require. CDC</td>
<td>Includes expenses for document reproduction.</td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td>Est CL node</td>
<td>Establish Clear Lake Node The project will network the ASV2 system in Morgantown, WV with a computer in the RODF in Clear Lake. The purpose of establishing the Clear Lake node is two fold. first, it will allow NASA's Center Information Network (CIN) users to directly access ASV2 services. Secondly, Reusable Software Library (RSL) capabilities developed in Clear Lake will be accessible to all AdNet users. This task will provide connectivity between ASV2 resources and the RODF, probably via Internet.</td>
<td></td>
</tr>
<tr>
<td>MTM</td>
<td>Est RSL</td>
<td>Establish Reusable S/W Library An initial reusable software library (RSL) capability provides a platform to assess the AdNet operations and required technology. It is used to validate the concepts of operations and the ability of existing technology to support operations. This effort will provide an initial RSL capability in the Clear Lake area. Tasks to accomplish this are discussed below.</td>
<td></td>
</tr>
<tr>
<td>SofTech</td>
<td>Platform Study</td>
<td>Evaluate RSLs An evaluation of existing RSLs will be made to determine the reusable software library system to be used for prototyping the research system. The evaluation will include the preparation of a set of initial criteria which will be approved by the project office. The study will update a prior RSL study conducted by GIG for the Space Station Software Support Environment. Subsequent tasks in this plan associated with establishing an RSL in Clear Lake are based on the assumption that the SofTech Reusable Software Library system will be chosen.</td>
<td></td>
</tr>
<tr>
<td>SofTech</td>
<td>Install RSL S/W</td>
<td>Provide Reusable S/W Library SofTech will make our proprietary Reusable Software Library (RSL) system available to the AdNet program in accordance with the data rights in Exhibit C. The system will be rehosted onto resources available to the AdNet</td>
<td></td>
</tr>
</tbody>
</table>

**LEGAL QUESTIONS:**
- What are the legal implications of transferring software to and from AdNet?
- Who retains the data rights to reusable software?
- Who carries the liability for reused software?
- What type of organization should act as the transfer agent?
project. Candidate computers for rehosting are the UHCL's RDIF 18k 651, Harris NCX-9, a leased VAX or other systems which may be provided by the project. The final selection will be based on factors including availability, accessibility, and software development support. Evaluations of software development tools may be necessary prior to computer selection.

**SofTech**

**Dev. Op. P/P**  
Dev Ops Policies/Procedures  
Operational strategies of AdaNet will be developed that provide guidance for the conduct of all activities related to AdaNet. It will provide information regarding the AdaNet organization and staff, RSC (reusable software component) selection, development and maintenance, operations, and reuse advocacy.

The strategies for organization and staff must address the roles and responsibilities of each member of the AdaNet Center. Specific duties must address the following:

Policy - Develop and maintain policies that address standards, guidelines, data rights, liability, warranties.

Publicity - Provide advocacy for AdaNet by analyzing and promoting reuse benefits and advertising.

Technical Guidance - Provide guidelines to produce RSCs, training for reuse retrieval support, and RSC use.

RSC Descriptions and Products - Provide information on RSC descriptions, costs, sources, classification and distribution.

Histories - Track user feedback about their success or problem with RSCs and maintain history.

Analyze AdaNet Experience - Collect and analyze experiences related to RSC use and cost effectiveness.

RSC Collection - Stay abreast of opportunities and present the forthcoming applications for sources of new or enhanced RSCs.

RSC Development and Acceptance - Qualify and enhance RSCs as needed to meet AdaNet standards.

RSC Classification, Evaluation, Maintenance - Ensure RSCs are properly described for easy retrieval, ensure RSCs comply with applicable standards and enhance RSCs as they evolve.

Administrative Support - Process reports, follow-up on users, handle problem reports and manage user accounts.

This task shall develop the overall strategies, policies and procedures to operate the RSL. The policies and procedures will be tested by populating the RSL with information taken from NASA and DoD programs which are not subject to restrictions. After successful trial use of these policies and procedures, the operations personnel will be trained in their appropriate use.

**SofTech**

**GNG**

**Train Ops. Pers**  
Train Operations Personnel
Operations personnel shall be trained in the proper use and maintenance of all operational software, policies and procedures.

**SofTech**

**MTN**

**Dev. New Element**  
Develop New Element

**Regtms. Analysis**  
Requirements Analysis

**Adamet requirements analysis will be performed to better understand the requirements developed during the**
requirements definition activities. Its focus is to assess the feasibility of the requirements in terms of requirements compatibility, necessary technology to implement requirements, and those requirements that have high cost relative to their benefit. It will consider the requirements in terms of mission needs, commercial realities and administrative policies affecting development and experience of Adak and other projects promoting the transfer software engineering technology. This effort will be in two phases. The first phase is focused on the analysis of the initial research system requirements, while the second is oriented toward extending analysis based on feedback from the operational system.

**System Rqmts.**

Based on the Concept Document and User Requirements developed during the Requirements Definition phase, this task will analyze the requirements to determine which requirements should be incorporated into the research system, which should be deferred, and which should be rejected based on trade studies of cost, feasibility and benefit. To support this effort both requirement and functional models that depict the capabilities and functional architecture of the Adak system will be developed. The requirement models address the operational capabilities, policies and procedures for using Adak, while the functional architecture models describe the underlying information schema necessary to support the Adak system and the information management system needed to process Adak service requests. Additionally, an assessment of NASA/JSC SEAD system will be made to determine how to integrate its services into the Adak system.

**SofTech**

**M/Deliver Rqmts**

**Milestone: Deliver Requirements**

**System Req. Rev.**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description/Note Text</th>
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<tbody>
<tr>
<td>UNCL</td>
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<td>MTM</td>
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<tr>
<td>SofTech</td>
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<tr>
<td>OMG</td>
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</table>

**Sustaining**

During operational use of the research system, additional requirements analyses shall be conducted to determine which capabilities to introduce into the research system. Specifically, reuse issues will be addressed to refine the policies and procedures for operating the Adak system. The issues, discussed in more detail in the SofTech report "Software Reuse Issues Affecting Adak", dated July 5, 1989, are summarized below:

- **Types of Reusable Software Components - Market analysis** is needed to determine what types of RSCs are needed, how they are selected, their appropriate level of granularity, and their consistency of quality.
- **Methodology** - To what extent will the Adak program participate in the development of approaches to improve RSC utilization?
- **Incorporation** - How should RSCs be described to facilitate their use?
- **Technical Guidance** - To what extent will technical guidance be provided?
- **Distribution** - In what forms (i.e. electronic bulletin board, floppy disks, etc.) will the RSC descriptions be distributed?
- **Acquisition** - What type of procedures will be employed to support the acquisition of RSCs?
- **Retrieval Methods** - Which techniques of retrieval will be
RSC Critical Mass - What is a sufficient number of RSCs, with adequate quality in relevant domains, for users to make effective use of AdaNet?

SofTech

Enh Reusable Sys / Enhance Reusable System
System enhancements shall be made to facilitate the research of software reuse issues. These will be based on the results of system requirements, requirements analysis, trade studies, and an evaluation of relative benefits. System requirements will be categorized as either accepted without qualification, research system requirements, and rejected requirements. This task shall focus on the development of research system requirements to illuminate critical areas of reuse technology. Accepted requirements will only be implemented to the extent they are necessary to support the research.

Enhance Release1
SofTech

3.3.2.0.000

Enhance Release2
SofTech

3.3.2.1.062

Enhance Release3
SofTech

3.3.2.2.063

Enhance Release4
SofTech

3.3.2.3.064

Enhance Release5
SofTech

3.3.2.4.065

Enhance Other
The below activities represent policy and procedural enhancements to the research system. All plans will require approval before being implemented.

Help Desk
Develop plans and procedures for supporting Help Desk functions.
SofTech

3.3.3.0.000

CL Services
The initial users of AdaNet in the Clear Lake area will be the JSC community, and they need to be surveyed to assess their needs. This task will use the results of surveys, conducted by the AdaNet Project's Requirements Definition team, to develop plans for providing responsive support to the JSC community.
SofTech

3.3.3.1.067

Product Info.
Plan the development of a system for acquiring and maintaining product information.
SofTech

3.3.3.2.068

Resource Directory
Plan the development of a system for acquiring and maintaining Software Engineering resources (training, consultants, etc.)
SofTech

3.3.3.3.069

Assess Technology

3.3.3.4.070

3.3.4.0.071
New technologies and methods of representing reuse information will be investigated to assess their feasibility. This effort is distinguished from requirements analysis in that it addresses approaches for reuse that may be incorporated into the System Specification but too immature to be included in any of the planned enhancements during the two year research effort. Prototypes will be investigated for their suitability to support advanced information systems. Specifically, technologies such as Object Management Systems and the Teradata Database System will be examined. Also, the requirements and functional models will be extended to reflect the capability to represent information as an EA/RA description. This description provides the ability to represent and relate information such as requirements, design, design rationale, source code, test programs and other software artifacts.

<table>
<thead>
<tr>
<th>Heading/Tasks</th>
<th>Resource</th>
<th>Description/Note Text</th>
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<tbody>
<tr>
<td>Develop Sys Spec</td>
<td></td>
<td>Based on the research findings during the evaluation of prototype operations and other trade studies, a System Specification shall be prepared and delivered.</td>
</tr>
<tr>
<td>Develop Mgmt</td>
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<td>Develop. Travel</td>
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<tr>
<td>Develop. ODC</td>
<td></td>
<td>ODCs to support Development are as follows:</td>
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<tr>
<td>Item</td>
<td>Description</td>
<td>Cost/Year</td>
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<td>FEDEX</td>
<td>$150</td>
<td>$300</td>
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<tr>
<td>Xeroting, Printing</td>
<td>1500</td>
<td>3000</td>
</tr>
<tr>
<td>Long Distance</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>Computer Time</td>
<td>2250</td>
<td>4500</td>
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<td></td>
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<tr>
<td>Operations</td>
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<tr>
<td>Maintain Info</td>
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<td>Maintain Information</td>
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<tr>
<td>Gen Info Maint.</td>
<td></td>
<td>Maintain General Information</td>
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<tr>
<td>Maintain Conference Information</td>
<td></td>
<td>Maintain a database of current conference information</td>
</tr>
<tr>
<td>Maintain Contracts Information</td>
<td></td>
<td>Maintain a database of current RFPs and contract awards through monitoring the Commerce Business Daily as well as other print sources available onsite.</td>
</tr>
<tr>
<td>Maintain News Information</td>
<td></td>
<td>Includes scanning publications identified in News document generation information for pertinent information and maintaining a current database.</td>
</tr>
<tr>
<td>Maintain Products Information</td>
<td></td>
<td>Includes selecting product information from that received inhouse, scanning publications and requesting full information based on articles or advertisements contained therein and maintaining this information in a database.</td>
</tr>
<tr>
<td>Maintain Publications Information</td>
<td></td>
<td>Includes identifying citations to publications and identifying and obtaining print or electronic copies of</td>
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</tbody>
</table>
### Heading/Task Resource | Description/Note Text | UBS Code
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non-copyrighted standards, guidelines, defining, or newsletters and maintaining this information in a database. | | 4.1.2.0.079
- Maintain Reference Information Includes maintaining acronym translation file, glossary of terms, ASR information files, keyword lists, and lists of names and addresses by scanning information, received inhouse for applicable information for each file and maintaining this information in a database. | | 4.1.2.0.079
- Maintain Training Information Includes sorting training/education information from that received inhouse, extracting and entering it into a database. | | 4.1.2.0.079
**Reusable S/F Vet** Maintain Reusable Software
- Maintain ASV2 Reusable Software Includes regular updates of the reusable software from the ASR and other sources investigating the large software systems in order to find standalone components and subsystems, assigning keywords and creating appropriate categories for new software in accordance with standard procedures. | 4.1.3.0.080
| Physical Lib Nmt | Maintain Physical Library | 4.1.3.0.080
Includes processing all incoming materials, assigning an LC classification number and preparing a catalog record for all materials being added to the collection, recommending purchases, maintaining a library catalog, maintaining a serials holding list, maintaining a serials check-in file, maintaining a record of items checked out of the library, providing assistance in use of the physical library, and providing assistance in obtaining materials needed which are not available onsite. | | 4.1.4.0.081
- Perform Quality Measures Determine timeliness, completeness, and accuracy of ASV2 information in accordance with standard procedures. | | 4.2.0.0.000
- Prepare and Distribute Report Combine all statistics in a summary report on a monthly basis and distribute as required. | | 4.2.1.0.083
**Support Users**
- Distribute Information Includes the distribution of AdaNet information and AdaNet account applications to potential users. | | 4.2.1.0.083
- Process New Accounts Includes processing applications for new accounts according to the current ASV2 model. User guides will be sent out and training provided. Mailing lists and datafiles will be updated accordingly. | | 4.2.1.0.083
- Distribute User Guides Current versions of user Guides will be distributed to each new user. Each guide will contain a copy of the Kermit and ProComm communication software and a Telenet brochure listing the U.S. access telephone numbers. Upon completion of any new versions or supplemental user guides | | 4.2.1.0.083
guides, copies will be distributed to all AdaNet users.
- Collect User Information
User information will be collected from the user application to create and update mailing lists and data files for the usage reports. Such information will include the full name, title, company, address, phone number and requested user identification.

Information on the primary function of the user's organization, size of the company, use of Ada within company electronic networks used and whether or not the company develops software will also be collected. This information may be submitted for use in the evaluation of the service or research purposes.

Technical information will be kept such as the equipment and communications software being used. This information will be vital in troubleshooting user problems.

List processing within CEO will be used for this purpose. This will allow each time of information on the user to be entered separately making it possible to perform a search for each field. For example, a search for users within a particular organization or a certain state can be performed.

This information will also be added to the master user data file on the VAX.

NTW
Support Users
- Distribute Output Requests
User Services will provide users with hardcopies or disks containing information found on-line. On-line documents may be queried by the user to one of MountainNet's printers or to be loaded on disks. The User Service Coordinator will check printers and the on-line queue display for such requests daily.

- Solve Problems
Users will be provided with on-going technical support. User Services will be the first point of contact to the users needing assistance. A trouble report form will be completed detailing the problem and equipment used. User Services will ask for assistance or direct the trouble report to other staff members as needed. Documentation will be kept on how the problem was resolved for future reference.

- Distribute User Guide Updates
User Guides will be updated periodically as a result of developmental changes. Users will be notified of any new services or changes to the existing service. Supplements to the user's guide or any updated versions of the guides will be distributed to all users as they are completed.

- Participate in Project Briefings
Project briefings will be held for targeted interest groups to promote project visibility and give potential users an overall insight to the project. A project presentation will consist of a briefing of the AdaNet project giving it's history, current status and goals. Following the briefing will be a hands-on demonstration of the system to potential users.

- Attend TriAda
Attendance at the TriAda conference is necessary to promote project interaction with communities of targeted potential users. The AdaNet booth display will be set up and demonstrations of the system will be performed. Staff will also be available to answer questions that potential users may have. Product handouts and user applications will be available for distribution.
<table>
<thead>
<tr>
<th>Reading/Task</th>
<th>Resource</th>
<th>Description/Note Text</th>
<th>WBS Code</th>
</tr>
</thead>
</table>
| Submit Code | 4.2.3.0.085 | Maintain User Guides As Required  
- Update User Guides As Required  
The ASV2 User Guide will be revised periodically to provide the users with documentation to use the ASV2 system efficiently. Updated versions of the guide will be forthcoming to reflect any changes to the menus or the user commands within the ASV2 system. Revisions will be done also to reflect changes to the system as a result of user feedback. Electronic on-line version located in the Reference drawer will also be updated. |
| Document Users | 4.2.4.0.086 | Maintain User Mailing Lists  
User Services will continuously update the user mailing lists on-line. List processing within CEO will be used. The mailing list will be contained in the Reference drawer, User Directory folder. Additional mailing lists may be developed to focus on a particular interest group.  
- Maintain On Line Data Files As Required  
At least two online master data bases will be maintained including the master user database and system use log database.  
- Update User Files  
User files such as mailing lists, user applications, etc. will be updated to reflect any personal information changes. Inactive accounts will be removed from the current files periodically. |
| Usage Data Report | 4.2.5.0.087 | Report Usage Data  
- Prepare and Distribute Usage Reports  
Transport login and access data from ASV2 and/or other online services to master usage database. Recode and organize usage data as required. Run SAS and/or other basic statistical summaries on usage data. Distribute reports on a monthly basis to all project teams.  
- Prepare and Distribute User Feedback  
Compile user feedback collected via letters, telephone calls, electronic mail, or any other means. Distribute reports on a monthly basis to all project teams.  
- Log Requests for Off-Line Information  
Record in detail all requests for offline information. Compile summaries of such requests and distribute to... |
<table>
<thead>
<tr>
<th>Heading/Task Resource</th>
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<tbody>
<tr>
<td>project team members. Participate in planning the Software Engineering Help Desk.</td>
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<tr>
<td>- Maintain Output Requests Log A log will be maintained on output requests. This log will contain such information as the date, username, queue used, drawer, folder and name of the document, and the date the printout was mailed to the user. This data will be maintained in analyzable form to the project team as required.</td>
<td></td>
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<tr>
<td>- Document Trouble Reports All trouble reports will be documented. Logs will detail the date of the report, nature of the problem, how the problem was resolved, person handling the report, date and by whos user was notified with help and/or a solution. Logs will be used as a reference for future calls and to evaluate future developments needed. This information will be provided in analyzable form to the project team as required.</td>
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<tr>
<td>MTH</td>
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<td>4.3.0.0.000</td>
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<tr>
<td>UWU OCT</td>
<td></td>
<td>4.3.0.0.089</td>
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<tr>
<td>Maintain Systems</td>
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<tr>
<td>Install Hardware - Install SPX-50 Install multiplexor interface between Data General computers and wide area telecommunications networks. This device will allow more serial asynchronous connectivity for Adalet users. The current SPX-50 will reach capacity prior to the end of December 1989, and has no room for expansion. - Install Ethernet Ethernet will provide the physical connectivity between all Adalet H/2000 and H/2000 II computers for file sharing and user communications. - Install 2mb 8mm Tape Backup This device will provide a more efficient disk backup system saving on system down time and personal service requirements. - Install ECO+ PC Hardware This personal computer hardware will enable advanced monitoring of Adalet SPX and Series 2000 wide area networking devices, and will aid in recovery from equipment failure, capacity planning and network management. - Install 120mb disk drives for H/2000s These additional disk drives will permit the H/2000s to handle load for the Adalet project. Currently, the H/2000s have 1 35mb disk drive, which when loaded with DOS/VS and CEO systems software would have very little room for user files. The additional disk space is necessary given the Adalet environment. - Install new hardware as required Arrange shipping to West Virginia and install Teradata machine. Install other new hardware as required. MTH</td>
<td></td>
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<tr>
<td>Install Software - Install Software Updates and Revisions Install patches, upgrades, and revisions to all existing software on a timely basis, including operating systems, compilers, office automation, and application systems software. - Install New Software As Required Install new operating systems, compilers, office automation, application systems, or any other new software including internally developed enhancements to the Adalet</td>
<td></td>
<td>4.3.2.0.090</td>
</tr>
</tbody>
</table>
- Participate in operating telecommunications node(s) and/or computer systems located in the Clear Lake area as required.

MN

Operate WV Mode
- Install Raised Computer Floor
Raised computer flooring will permit the safe installation of wires running between AdaNet systems. Such wires permit networking and the electrical powering of equipment. Keeping wires from walkways protects humans as well as machines.

- Maintain System Performance
System performance is the speed at which computing devices are able to perform their operations. System performance can be held close to peak levels through proper systems performance management techniques.

Plans for disk space utilization will be updated as required. Lack of disk space can not only cause individual user file storage problems, it can shut down an operating system completely. Such cases are avoided by planning and management activities.

The disk optimizer software facilitates the reorganization of disk files, aimed at the shortest possible movement of disk read/write heads. The greater the amount of this movement, the slower the filing system is. Slow filing systems can lead to increased levels of user dissatisfaction.

As the AdaNet environment changes, it may become necessary to reallocate computer resources. For example, as the number of files and users increase, it may be necessary to increase the amount of cache memory available to the systems, by taking some of the available paging memory and realocating it.

- Establish ASV2 User Accounts
ASV2 user accounts permit computer access to the AdaNet service. These accounts permit tracking of user activity, necessary for the study of user behavior, and provide security through user accountability and built in operating system software and application system software facilities.

The User Service Division informs the Systems and Telecommunications Division when applications for user accounts are approved.

Usually within 24 hours of notification, user profiles are established. These profiles are read by operating system software and by application system software in authorizing users to access AdaNet computing services.

The Division of AdaNet User Services will be notified that the accounts are ready for use, and in turn will contact users as appropriate.

- Upgrade Skills As Required
The Systems and Telecommunications Division keeps its personnel well trained on the various systems required for the AdaNet Service. This training is necessary for proper operation and support of systems hardware and software.

Current skills and knowledge are measured against required skills and knowledge. Areas where there is a gap are targeted for skills upgrading.
<table>
<thead>
<tr>
<th>Heading/Task Resource</th>
<th>Description/Note Text</th>
<th>WBS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendors of professional development in targeted areas are identified through literature or professional contacts/referrals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrangements are made for AdaNet Systems and Telecommunications staff to engage in professional development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Provide User Training</td>
<td>Systems and Telecommunications staff often have the knowledge and/or resources to assist other project staff members. AdaNet staff members having questions have access to systems and telecommunications personnel. Where training is required, a person from this division is available to meet with others. End users are supported by the AdaNet User Services Division.</td>
<td></td>
</tr>
<tr>
<td>- Monitor Hardware Performance</td>
<td>Through user reports, messages on input/output devices, event record logs, and front panel displays, hardware is monitored. Determine that a problem is not software related through hardware testing, vendor support, and available documentation. Determine which hardware component is creating a problem through hardware testing, vendor support, and available documentation. Determine who is responsible for repair or replacement of hardware through maintenance agreements and vendor contracts.</td>
<td></td>
</tr>
<tr>
<td>- Operate and Maintain Teradata System</td>
<td>Operate the Teradata database platform to be located in the AdaNet Computer Center in Morgantown, including physical security, operator functions, and telecommunications links.</td>
<td></td>
</tr>
<tr>
<td>NTH</td>
<td>Operate Telecomm</td>
<td>4.3.5.0.093</td>
</tr>
<tr>
<td>- Maintain Internet Links</td>
<td>Operate and maintain TCP/IP routing devices, modems or data units, maintain telecommunications lines, systems software, and ethernet networks necessary for connection to Internet.</td>
<td></td>
</tr>
<tr>
<td>- Maintain Telnet Links</td>
<td>Operate and maintain X.25 packet assembler/disassembler, modems, maintain telecommunications lines, and network connections necessary for connection to Telnet.</td>
<td></td>
</tr>
<tr>
<td>- Maintain Futurecom Network</td>
<td>Operate and maintain switched packet exchange and servers, modems, maintain telecommunications lines and network connections necessary for connection to MountainNet.</td>
<td></td>
</tr>
<tr>
<td>- Monitor Telecommunications Performance</td>
<td>Monitor error rates and device connection channels and telecommunications links. Review event logs and analyze the frequency of events which indicate hardware or telecommunications problems.</td>
<td></td>
</tr>
<tr>
<td>NTH</td>
<td>Operations Mgmt.</td>
<td>4.4.0.0.000</td>
</tr>
<tr>
<td>Coop Trav Rep Do</td>
<td>Coordinate travel arranges &amp; reports</td>
<td>4.4.1.0.095</td>
</tr>
<tr>
<td>Make travel arrangements for all MountainNet project staff. Prepare travel itineraries and deliver to traveler. Ascertain that written requests to travel, expense reports, and trip reports are properly completed. Audit travel expenses per Federal Travel Regulations and enter that information into accounting system. Design, revise, and implement travel policies and procedures. Participate in formal training as required. Participate in formal audits of travel expenses as required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTH</td>
<td>Proc Gds &amp; Serv AR</td>
<td>4.4.2.0.096</td>
</tr>
<tr>
<td>Procure goods/services as required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Procure all goods and services required for execution of the project. Prepare and execute purchase requisitions in accordance with established policies and procedures and Federal Acquisition Regulations including documentation of competition or sole sourcing as appropriate. Enter procurement data into accounting system. Design, revise, and implement procurement policies and procedures. Participate in formal training as required. Participate in formal audits of procurements as required.

**MTN**

Prep, Monit Neg Contr Prep/monitor/negotiate-contracts/subcontracts

Prepare project work breakdown schedules, plans, budgets, proposals, contracts, and contract modifications and participate in reviews of same as required. Supervise and monitor all project activities by MountainNet staff, subcontractors, and consultants as required.

**MTN**

Cost Acct. Account for & invoice project

Compile all operating, travel, payroll, subcontract, consultant, and other costs using the SCAR approved accounting system. Maintain hardcopy documentation of all costs as required by Federal Acquisition Regulations. Prepare and transmit invoices to UNCL for all incurred costs. Document incurred costs as requested by UNCL. Participate in informal and formal audits as required. Resolve questioned costs as required. Participate in formal training as required.

**MTN**

Est, Rev, BUD P/P Estab/rev/update policies/procedures

Establish, review, revise, and update all policies and procedures as required to ensure compliance with all applicable regulations including but not limited to travel, procurement, accounting, property control, personnel, and standard operating procedures for maintaining information, assisting users, and maintaining computer and telecommunications systems.

**MTN**

Operat. Travel

**MTN**

Operations ODC

**MTN**

Evaluation

The activities in this task include coordination with the requirements definition, development and operations activities to evaluate:

- the degree to which the research prototype (inputs, configuration, and operations) supports the current requirements

- existing products and services on their quality, utility, accessibility, client satisfaction, and efficiency

- the degree to which the Adelnet products and services are reaching the appropriate clients

This activity commences immediately with the evaluation of the existing Adelnet system and continues interactively upon the release of each major Adelnet enhancement.

**Define Data**

Define Data to be Collected

Define which features of the operational Adelnet prototype are to be evaluated. Determine the user requirements these features meet. Develop evaluation criteria for each feature and define what data should be collected from operations or other sources to validate the utility of each feature. Develop an evaluation plan for collecting the
<table>
<thead>
<tr>
<th>Heading/Task Resource</th>
<th>Description/Note Text</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collect Data</strong></td>
<td>Collect operational data for the features under evaluation from data sources that include the AdaNet operations team, the User Help Desk, solicitation, and other sources as required by the evaluation plan. Data will be collected on a monthly basis for three months per evaluation.</td>
</tr>
<tr>
<td><strong>Summarize Data</strong></td>
<td>Assemble these data into useful categories by feature for analysis.</td>
</tr>
<tr>
<td><strong>Analyze Data</strong></td>
<td>Analyze the data collected relevant to each feature under evaluation and report on each feature's utility, performance, quality, etc. Report on those features found to be desirable, or not useful. Trace those features to the original user requirements document and deliver to the rest of the AdaNet Team for further consideration in the final user requirements document.</td>
</tr>
<tr>
<td><strong>Evaluation Agent</strong></td>
<td>Project direction, cost accounting, for evaluation.</td>
</tr>
<tr>
<td><strong>Eval. Travel</strong></td>
<td>Travel associated with AdaNet evaluation team.</td>
</tr>
<tr>
<td><strong>Evaluation OOC</strong></td>
<td>Includes expenses for document reproduction.</td>
</tr>
</tbody>
</table>

**WBS Code**

<table>
<thead>
<tr>
<th>WBS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.0.0.105</td>
</tr>
<tr>
<td>5.3.0.0.106</td>
</tr>
<tr>
<td>5.4.0.0.107</td>
</tr>
<tr>
<td>5.5.0.0.108</td>
</tr>
<tr>
<td>5.6.0.0.109</td>
</tr>
<tr>
<td>5.7.0.0.110</td>
</tr>
<tr>
<td>6.0.0.0.111</td>
</tr>
</tbody>
</table>
4. Deliverables

The delivery schedule of Ada.NET products is summarized below in accordance with the work breakdown structure.

<table>
<thead>
<tr>
<th>WBS</th>
<th>Data Requirement</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.5</td>
<td>Ada.NET Market Survey</td>
<td>2/11/91</td>
</tr>
<tr>
<td>2.2.4</td>
<td>Mission Concept Definition</td>
<td>8/04/90</td>
</tr>
<tr>
<td>2.3.3</td>
<td>User Requirements Definition</td>
<td>9/21/90</td>
</tr>
<tr>
<td>2.5.2</td>
<td>Legal Study Document</td>
<td>3/04/90</td>
</tr>
<tr>
<td>2.6</td>
<td>Monthly Contract Summary/</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Status Report</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Clear Lake Node</td>
<td>6/29/90</td>
</tr>
<tr>
<td>3.2</td>
<td>RSL</td>
<td>8/31/90</td>
</tr>
<tr>
<td>3.3.1</td>
<td>System Requirements</td>
<td>11/6/90</td>
</tr>
<tr>
<td></td>
<td>Rejected Requirements</td>
<td>11/6/90</td>
</tr>
<tr>
<td>3.3.2.1</td>
<td>Enhancement Release #1</td>
<td>2/12/91</td>
</tr>
<tr>
<td>3.3.2.2</td>
<td>Enhancement Release #2</td>
<td>5/07/91</td>
</tr>
<tr>
<td>3.3.2.3</td>
<td>Enhancement Release #3</td>
<td>7/30/91</td>
</tr>
<tr>
<td>3.3.2.4</td>
<td>Enhancement Release #4</td>
<td>10/22/91</td>
</tr>
<tr>
<td>3.3.4</td>
<td>Trade Studies</td>
<td>As required</td>
</tr>
<tr>
<td>3.4</td>
<td>System Specification</td>
<td>3/31/92</td>
</tr>
<tr>
<td>3.5</td>
<td>Monthly Contract Summary/</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Status Report</td>
<td></td>
</tr>
<tr>
<td>4.2.5</td>
<td>Usage Results</td>
<td>Monthly</td>
</tr>
<tr>
<td>4.4</td>
<td>Monthly Contract Summary/</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Status Report</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>Evaluation Reports</td>
<td>90 days after each enhancement release</td>
</tr>
<tr>
<td>5.5</td>
<td>Monthly Contract Summary/</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td>Status Report</td>
<td></td>
</tr>
</tbody>
</table>

Regular Contract Summary/Status Reports will be prepared in accordance with the format in Figures 4-1a, 4-1b, and 4-1c. Explanations of terminology for these reports are provided in Table 4-1.
Summary Presentation
of
AdaNet Monthly Costs/Performance/Status Report
For the Month Ending ____________

Subcontractor __________________________ Project Director __________________________

Research Activity Title __________________________

---

Summary Cost and Performance Information

<table>
<thead>
<tr>
<th>Percent Completed</th>
<th>Cost Estimates for Previous Month</th>
<th>Cumulative Cost Estimates</th>
<th>Forecasted Cost Current Month</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Status Report Overall Summary

Technical Status


Technical Problems


Projected Activities


Figure 4-1a  Cost/Performance Status Report, Summary

---

soFtech

2378-00-001  26
Monthly Status Report By Each Work Breakdown Element

Work Break Down Title

WBS NO.

Technical Status

Technical Problems

Projected Activities/ Accomplishments

Figure 4-1b Monthly Status Report by WBS

SOFTECH

2378-00-001 27
A Detailed AdaNet Monthly Costs/Performance/Status Report by Work Breakdown Elements*
For the Month Ending

Subcontractor

Project Director

Research Activity Title

Cost and Performance Information

<table>
<thead>
<tr>
<th>Work Breakdown Elements</th>
<th>Scheduled/Actual Start Date</th>
<th>Scheduled/Actual End Date</th>
<th>Percent Completed</th>
<th>Actual Effort</th>
<th>Actual Cost</th>
</tr>
</thead>
</table>

Figure 4-1c Cost/Performance Status Report, Detailed

SofTech

2378-00-001 28
Table 4-1  
Explanation of Terminology

I. Percentage Completion of Work Breakdown Elements
   An estimate of the percentage completion of each work breakdown element from its inception through the month indicated on this report.

II. Cost Estimates for Previous Month
   The amount of funds expensed against this research activity for the previous month. These expenditures include invoiced costs as well as an estimate of incurred costs not yet invoiced.

III. Cumulated Costs Estimate
   The total amount of funds that have been expensed against the research activity from its inception through the month indicated on this report.

IV. Forecasted Cost Current Month
   An estimate of expected expenditures for the month in which this report is submitted.

V. Technical Status
   A brief description of the previous month activities and accomplishments.

VI. Problems
   A description of critical incidences that may impede or that impede the orderly progress of the research activity.

VII. Projected Activities
   A brief description of the planned activities and accomplishments for the next month.
5. Organization

5.1. Team Members

The AdaNET Team, composed of the below organizations, has the necessary qualifications to implement the project plan. Their qualifications are as follows:

RICIS, UH-Clear Lake
- experience in software engineering
- knowledge of this project
- appreciation for project goals
- accomplished in project management
- good government and corporate relations

MountainNET
- original unsolicited proposal
- currently operating the prototype
- solid base in West Virginia
- small business orientation
- contract administration experience

West Virginia University
- Development
  - Information search and retrieval
  - Database design and implementation
- Operations
  - On-line data collection
- Evaluation
  - customer interface

SofTech
- well respected software engineering firm
- involved in the development of Ada
- developed RAPID Center for Army/ISEC
- assisted in project planning for one year

GHG
- software development firm
- supports reuse for Space Station Freedom/Software Support Environment
- central node for information and parts
- certified 8a small business

Staples Technology
- market research in information technology
- contacts through information industry
- small business
5.2. Team Structure

The team as represented in Figure 5-1 is contractually organized in the following manner. NASA/TU is the sponsoring organization and is responsible for overall AdaNET program management. Co-sponsors include the Ada Joint Program Office, Dept. of the Army, and OPTI/DOC. The program receives NASA technical direction from the Johnson Space Center with advice from the Project Control Board. It is administered through the UHCL RICIS under their cooperative agreement with Dr. Charles McKay serving as the Chief Technical Advisor. UHCL RICIS has contracted with MountainNET as the prime contractor. Major subcontractors for all work areas except Operations include GHG (Requirements and Evaluation) and SofTech (Technical Direction and Development). Other subcontractors supporting MountainNET, SofTech and GHG are contracted in a manner that is closely aligned with primary work area responsibilities. UHCL RICIS has also contracted with Applied Expertise to provide support for interagency relations.

The functional organization, i.e. operational structure, is represented in Figure 5-2. It principally differs from the contractual organization in that SofTech and MountainNET are acting in a leader-follower relationship. SofTech, as a subcontractor to MountainNET, is providing the Technical Director on behalf of MountainNET. The Technical Director reports directly to the RICIS Project Manager on all technical matters and is technically responsible for the overall technical direction of each work area. Also, interagency relations activities are under the direct control of the AdaNET Program Manager, NASA/TU.

5.3. Key Personnel

The following are key personnel and their major responsibilities from each organization:

**UHCL RICIS:**
- Peter Bishop - RICIS Project Manager

**MountainNET:**
- Robert Michael Digman - Contract Team Leader and Operations Team Leader
- Linda Braun - Contract Administrator

**West Virginia University:**
- John Grasso - Operations Data Collection and Evaluation Support
- John Atkins - Research in Development Technology Assessment
- David Eichmann - Research in Development Technology Assessment

**SofTech:**
- John McBride - AdaNET Technical Director
- David Auty - Development Team Leader

**GHG:**
- Lionel Hanley - Requirements and Evaluation Team Leader
AdaNET Contracting Organization

Reporting Structure

Figure 5-1  AdaNET Contracting Organization
Figure 5-2 AdaNET Technical Organization
6. Schedule

This section presents a Gantt chart of the AdaNET Research Project.
Figure 6-1 AdaNET R & D Schedule
Table 6-1  AdaNET R & D Schedule, cont.

<table>
<thead>
<tr>
<th>Task Description</th>
<th>VES Code</th>
<th>Out</th>
<th>Planned Start</th>
<th>Planned Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance Release 1</td>
<td>1.1.1.4.42</td>
<td>60</td>
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<tr>
<td>Enhance Release 2</td>
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<td>Enhance Release 3</td>
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</tr>
<tr>
<td>Enhance Other</td>
<td>1.1.1.4.45</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Help Desk</td>
<td>1.1.1.4.46</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>CH, Services</td>
<td>1.1.1.4.47</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Planning Office</td>
<td>1.1.1.4.48</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Finance/ họp</td>
<td>1.1.1.4.49</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Accounts Payable</td>
<td>1.1.1.4.50</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td>1.1.1.4.51</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>General Ledger</td>
<td>1.1.1.4.52</td>
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<td>03-13-91</td>
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<tr>
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<td>1.1.1.4.53</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Set-up</td>
<td>1.1.1.4.54</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Set-up Reports</td>
<td>1.1.1.4.55</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
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<td>03-13-91</td>
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<tr>
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<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Set-up Reports</td>
<td>1.1.1.4.64</td>
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<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Reports</td>
<td>1.1.1.4.65</td>
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<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Set-up</td>
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<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Set-up Reports</td>
<td>1.1.1.4.67</td>
<td>60</td>
<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
<td>Payroll Reports</td>
<td>1.1.1.4.68</td>
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<td>03-13-91</td>
<td>03-13-91</td>
</tr>
<tr>
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</tr>
<tr>
<td>Payroll Set-up Reports</td>
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<td>03-13-91</td>
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<td>Payroll Reports</td>
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<td>03-13-91</td>
<td>03-13-91</td>
</tr>
</tbody>
</table>

**Note:** The table contains a visual representation of the AdaNET R & D Schedule, with dates and codes for each task. The schedule is divided into columns for Out, Planned Start, and Planned Finish dates. The visual representation is a grid with shaded areas indicating the planned and actual progress of each task.
7. Cost and Labor Hours

This section provides cost dates and labor hours for the project at these levels of detail. Table 7-1 provides the cost and labor hours summary by major functional areas. Table 7-2 provides cost and labor hours dates at the second level of the WBS, while Table 7-3 depicts the allocated cost and labor hours for each task by resource. These costs reflect fully loaded costs to the project, including any G&A and fees imposed on subcontractors. It does not reflect actual funds individual resources are to be authorized. Funding authorizations are handled by separate contract agreement and are not within the scope of this plan. Table 7-4 presents the projected costs by fiscal year for each task, while table 7-5 presents the project fiscal year hourly and cost allocations by resource again, these costs are fully loaded through fee for any subcontractors. Table 7-6 presents the project costs by month for each task.

Table 7-1  Project Hours and Cost, First Level

<table>
<thead>
<tr>
<th>Heading/Task</th>
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