AdaNet Research Plan

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SofTech, Inc.

May 1, 1990

Cooperative Agreement NCC 9-16
Research Activity IM.14

NASA Johnson Space Center
NASA Technology Utilization Program
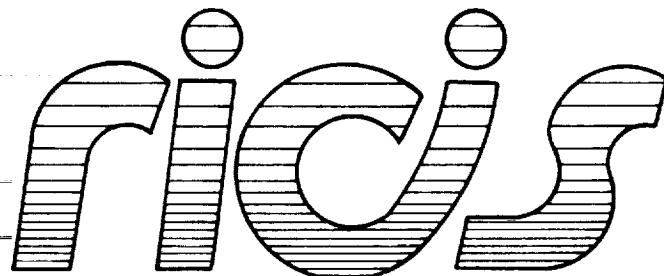
Research Institute for Computing and Information Systems
University of Houston - Clear Lake

T·E·C·H·N·I·C·A·L   R·E·P·O·R·T

The RICIS Concept

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
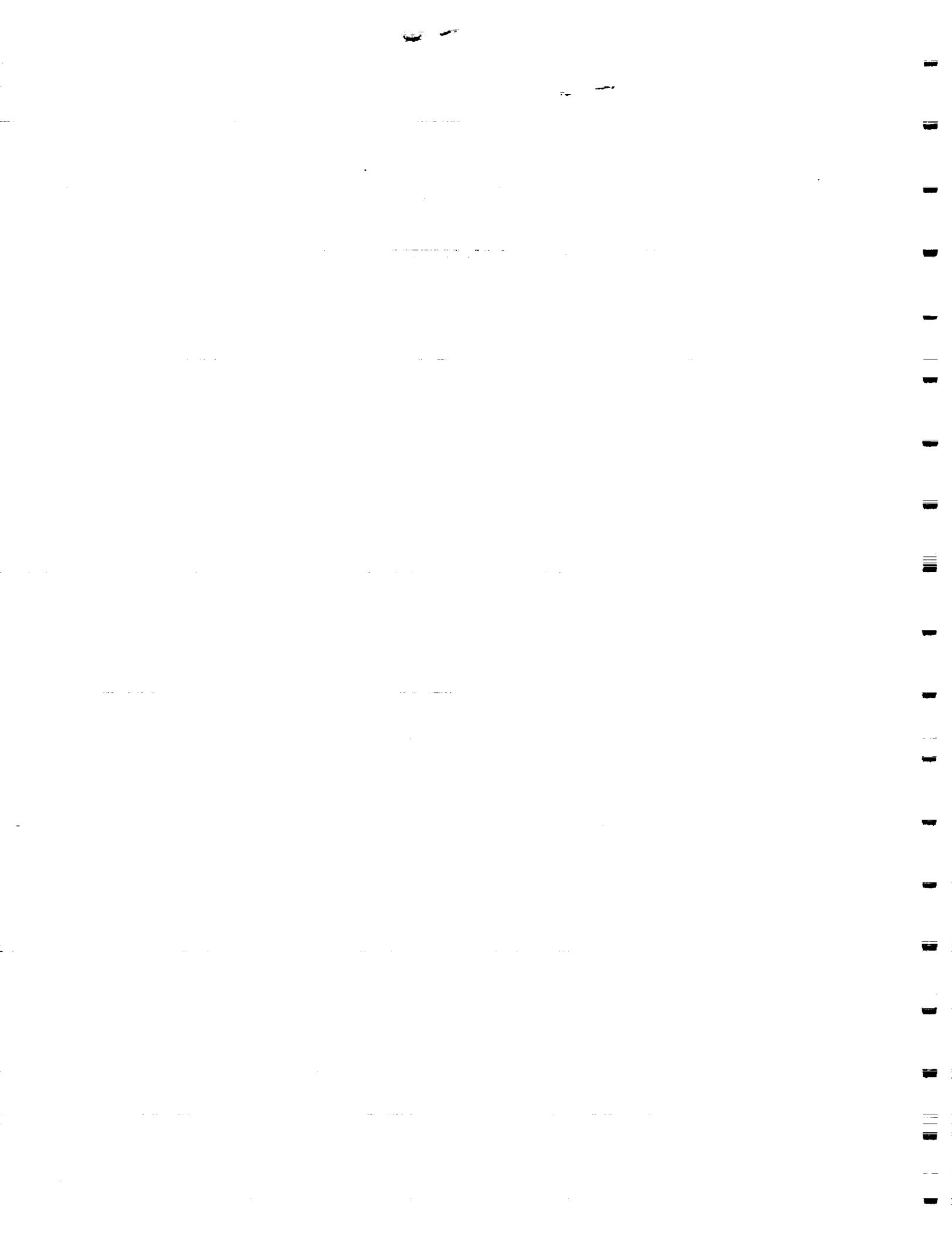
Preface

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.

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.
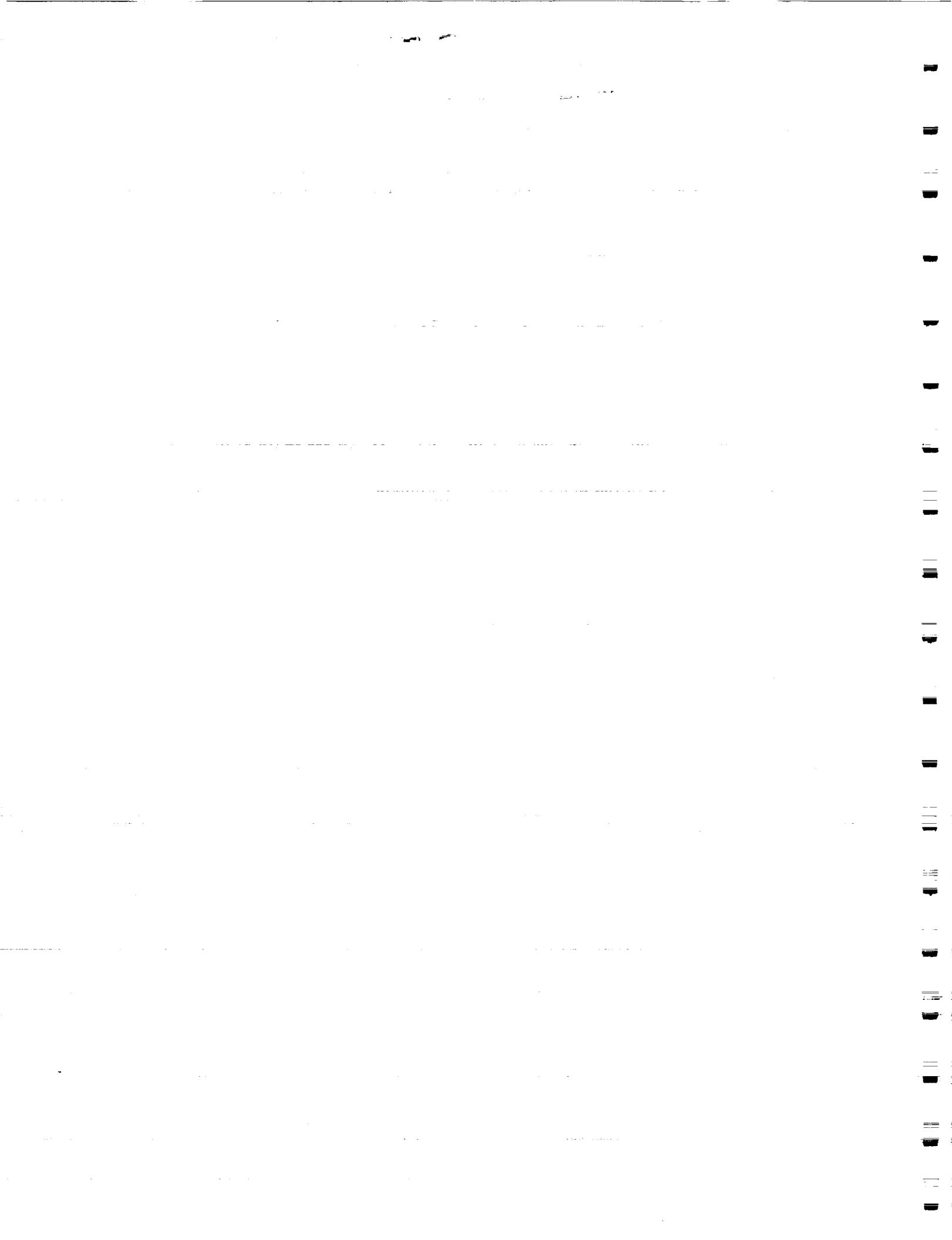
AdaNET

Research Plan

May 1, 1990

Contract IM.14

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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 activites 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 visibilty 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
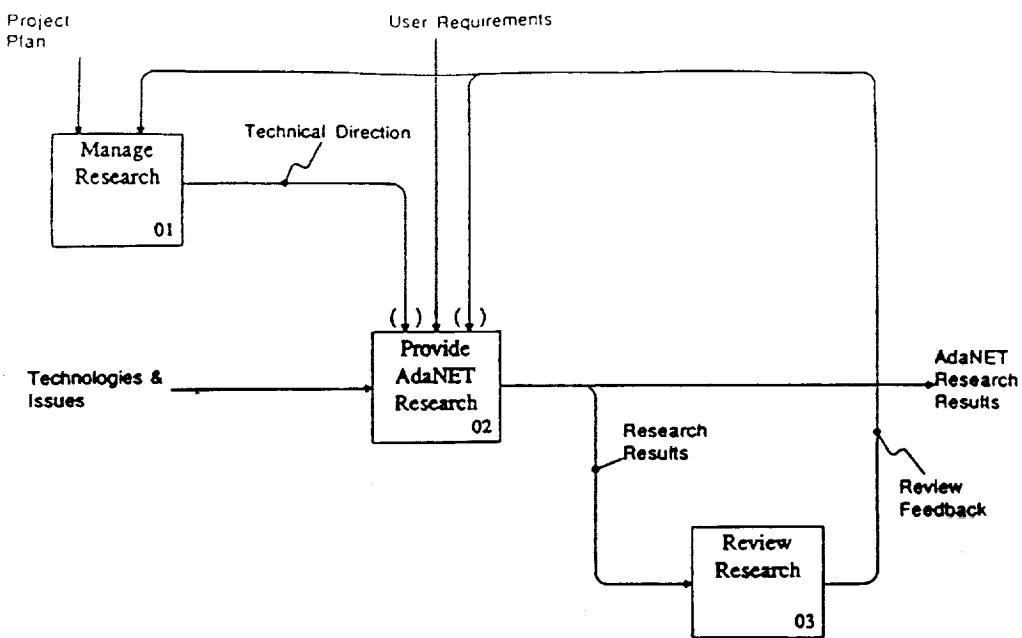
Figure 2-1   Implement AdaNET Research Plan

Figure 2-2   Provide AdaNET Research Plan

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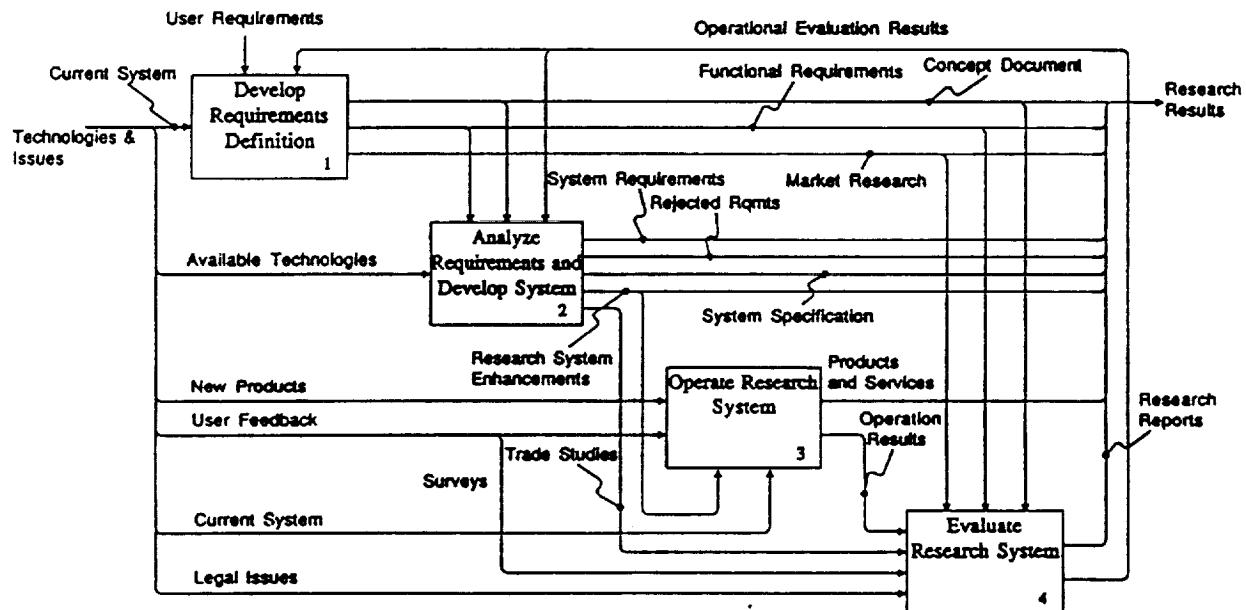
2.2. Analyze Requirements and Develop System

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 activites include:

*   maintaining the AdaNET information including information on conferences, contracts, news, products, publications, references and training, resuable 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 3-1   Work Breakdown Structure & Task Descriptions

Heading/Task Resource	Description/Note Text	WBS Code
ADANET.PJ		0.0.0.0.000
Project Office		1.0.0.0.000
Management		1.1.0.0.000
Rserch Actv Mgmt Research Activity Management	The UHCL AdaNet Project Manager will provide support to AdaNet by:	1.1.1.0.002
	- Supervising AdaNet Project - Coordinating with related activities - Preparing briefings & presentations - Reporting Status to NASA - Attending Conferences & Seminars on related topics	
UHCL AE Program Mgmt.		1.1.2.0.003
MTN Technical Mgmt	The Technical Director is responsible for monitoring the technical performance on the contract, providing technical direction, promoting team communication, and recommending plan adjustments.	1.1.3.0.004
SofTech Data Management	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.	1.1.4.0.005
IFB Support		1.2.0.0.000
Meetings&Reviews		1.2.1.0.000
Project Reviews	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 WV once per quarter and Houston at other times.	1.2.1.1.007
MTN SofTech GHG NASA Reviews	Meetings shall be held quarterly to review progress with NASA HQ TU in Washington, D.C. Attendees shall include JSC Monitor, RICIS Project Monitor, MountainNet Program Manager and Technical Director.	1.2.1.2.008
SofTech MTN GHG Advisory Group	Meet with UHCL convened advisory group to present AdaNET research. Plan to meet semi-annually for one day.	1.2.1.3.009
MTN SofTech		

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Heading/Task	Resource	Description/Note Text		WBS Code
	GHG			
	Adv. Grp.			
Conferences				1.2.2.0.000
TriAda 90				1.2.2.1.011
	MTN			
	SofTech			
	GHG			
	UHCL			
TriAda 91				1.2.2.2.012
	MTN			
	SofTech			
	GHG			
	UHCL			
General Conferen				1.2.2.3.013
Travel				1.2.3.0.014
	MTN			
	SofTech	.		
	GHG			
	UHCL			
	AE			
OtherDirectCosts		Other Direct Costs		1.2.4.0.015

OtherDirectCosts — Other Direct Costs

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

Item Description	Year 1	Year 2
Organization Dues & Fees	$ 200	$ 200
Xeroxing, Printing	1,200	1,200
Postage, Shipping	600	600
Telephone Equip. & Long Dist.	2,400	2,400
Office Supplies	1,527	2,300
Books, Subscriptions	300	300
	-----	-----
Total estimated ODC-Proj. Office	$6,227	$7,000

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:

Item description	Year 1	Year 2
Conference Fees	$ 3,244	$ 3,244
Meeting Costs	1,298	1,298
ADPE	5,408	5,408
	------	------
Total ODCs for Applied Expertise	$ 9,950	$ 9,950

The equipment and software to be provided by the UHCL to support SofTech on WBS 1.2.4 is the following:

Equipment Type	Function	Qnty	Estimated Cost
OS2 80386 or equivalent	Project Management	1	$ 5000
Mac II	Office workstation and CASE support	5	38500
Laser printer	Printer for IBM and Macs	2	3000

Subtotal			$46500

Software	Application		
PC			

Word	Word Processing	1	$ 400

Heading/Task	Resource	Description/Note Text			WBS Code
	SuperProject Expert	Project Management	1	600	
	ProComm Plus	Modem Communications	1	60	
	Quattro Pro	Spreadsheet	1	300	
	RAF	Network to VAX for backup, data exchange	1	500	
	Mac ---				
	Symantec Utilities	Virus prevention, File recovery	5	900	
	Design/IDEF	Functional/data modeling	1	3000	
	DataSculptor	Entity-Relation modeling	1	1000	
	SuperPaint	Bit-mapped graphics	5	750	
	MacDraw	Object-oriented graphics	5	1450	
	MacProject II	PERT Chart graphics	1	370	
	Mac240	MicroVAX connectivity	5	1000	
	PowerPoint	Presentation production	5	1200	
	Excel	Spreadsheet	2	480	
	Word	Word processing	5	1200	
	Silver Utilities	Network Software	5	1250	
	Pyro!	Screen saver	5	75	

	Subtotal			$14535	
	Total ODC (Hardware and Software)			$61035	

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            MTN
            SofTech
            UHCL
            GHG
            AE
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Requirements		Requirements Definition	2.0.0.0.000

AM Market Survey			2.1.0.0.000

A Market Study will be performed to help identify potential
AdaNet users, contributors to the AdaNet Library and
candidate application domains for initial RSC population.
The domains will be evaluated with respect to the potential
number of users, maturity of the domain, their likelihood
of using Ada in the near future, and the potential of
'harvesting' RSCs and 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.

Market Surv Plan		AdaNET Marketing Survey Plan	2.1.1.0.018

A short planning phase will detail the survey questions
and will 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 COSMIC	Army RSL	Martin Marietta	SEI
NASA GSFC	STARS	Contel	FAA
NASA JPL	SDIO	IBM ISD	NOSC
NASA SSE	CAMP	Unisys	RAPID
NASA SSPO	NTIC	Boeing	JAIUG
NASA JSC	DTIC	IEEE	DACS
Fed Lib Dep Prg		HOSSC	

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        GHG
        JStaples
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M/Mrkt Srv Pln D		Milestone:Market Survey Plan Deliver	2.1.2.0.019

Survey Pln Rev.		Survey PLAN Review	2.1.3.0.020

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        GHG
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Market Survey		AdaNet Marketing Survey Data	2.1.4.0.021

This includes personal and telephone interviews of the

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Heading/Task Resource	Description/Note Text	WBS Code

target population. Besides gathering data, this personal interview process is designed to help gain support for the AdaNet project throughout the user community. As the survey progresses, the target population may be expanded as potential AdaNet users are identified and as time allows.

GHG
Dyer/FA

M/Survey Data D		2.1.5.0.119
Market Study	AdaNet Marketing Survey	2.1.6.0.023

The final phase of the Market Study entails the analysis of the survey data and culminates in a report called "AdaNet Market Survey".

GHG
JStaples

M/Mrkt Study Del	Milestone:Market Study Delivery	2.1.7.0.024
Survey Review	SURVEY Review	2.1.8.0.025

GHG

Mission Definiti	Produce Mission Concept docs	2.2.0.0.000

The contractor shall define a new "AdaNet Statement of Mission" in a brief concept document. The current AdaNet mission, system, and requirements shall be analyzed with regard to the important role the AdaNet system can play in uniting the resources of the NASA Office of Technology Utilization and other similar government agencies. The AdaNet 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 AdaNet is broadened, a new name shall be suggested for the AdaNet system.

Analysis Definit	Analysis Definition	2.2.1.0.027

TBD
GHG
SofTech
Dyer/FA

Mission Concept		2.2.2.0.028

Current AdaNet documents will be collected and the statement of mission, system, and requirements will be analyzed. The original authors of the AdaNet documents will be available as consultants to assist in this analysis. AdaNet Management from NASA and RICIS will play an integral role in defining the AdaNet mission and defining the AdaNet System Concept that can accomplish that mission.

GHG
SofTech
Dyer/FA

M/Pre Cncept Doc	Milestone:Preliminary Mission Concept Document	2.2.3.0.029
M/FinlCncept Doc	Milestone:Final Mission Concept Document	2.2.4.0.030
Cncept Docu Rev	Concept Document Review	2.2.5.0.031

GHG
SofTech

User Reqmts Defi	User Requirements Definition	2.3.0.0.000

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 AdaNet Mission Concept Document.

User Req. Doc.	User Requirements Document	2.3.1,0.033

Requirements for the AdaNet system will be gathered from several sources. These include the existing AdaNet system

Heading/Task	Resource	Description/Note Text	WBS Code
		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.	
	GHG SofTech Dyer/FA		
M/Prel User Req		Milestone:Prel User Require. Doc	2.3.2.0.034
M/Final User Req		Milestone: User Require. Document	2.3.3.0.035
User Req Doc Rev			2.3.4.0.036
	GHG SofTech		
Refine Req. Doc.		Refine Requirements Document	2.3.5.0.037
	GHG SofTech Dyer/FA		
Coor/User Groups		Coordinate with User Groups	2.4.0.0.000
		The contractor shall ensure ongoing communication between the AdaNet project team members and various software reuse interest groups.	
Estab SIGs/Reuse		Special Interest Groups on Reuse	2.4.1.0.039
		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 place on the Clear Lake software development community. Candidate organizations are:	
		Space Station Freedom Software Support Environment (SSE) RAPID / COSMIC; Contel Beckly College; SEI Shell; Martin Marietta Boeing; IBM SID Strictly Business; STARS	
	GHG		
SIG Mtgs. & 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.	2.4.2.0.040
	GHG		
SIG Liaison			2.4.3.0.041
TBD			
	GHG		
Prod.legal reprt		Produce Legal Report	2.5.0.0.000
		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.	
Legal Review			2.5.1.0.043

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Heading/Task	Resource	Description/Note Text	WBS Code

GHG
LegalCons

Legal Study Doc.
    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 guaranties. An extensive bibliography will be included. NASA and other legal council may be consulted as required.

    LEGAL QUESTIONS:

    - What are the legal implications of transfering software to and from AdaNet?
    - 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?

2.5.2.0.044

GHG
LegalCons

Require. Mgmt.
    Project direction, cost accounting, projections, scheduling.

2.6.0.0.045

GHG

Require. Travel
    Travel associated with requirements definition.

2.7.0.0.046

GHG

Require. ODC
    Includes expenses for document reproduction.

2.8.0.0.047

GHG

Development

3.0.0.0.000

Est CL node   Establish Clear Lake Node
    The project will network the ASV2 system in Morgantown, WV with a computer in the RCDF 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 AdaNet users. This task will provide connectivity between ASV2 resources and the RCDF, probably via InterNet.
                MTN
                SofTech

3.1.0.0.049

Est RSL   Establish Reusable S/W Library
    An initial reusable software library (RSL) capability provides a platform to assess the AdaNet operations and required technology. It will be 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.

3.2.0.0.000

Platform Study   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 GHG 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.
                SofTech
                GHG

3.2.1.0.051

Install RSL S/W   Provide Reusable S/W Library
    SofTech will make our proprietary Reusable Software Library (RSL) system available to the AdaNet program in accordance with the data rights in exhibit C. The system will be rehosted onto resources available to the AdaNet

3.2.2.0.052

Heading/Task	Resource	Description/Note Text	WBS Code

project. Candidate computers for rehosting are the UHCL's RCDF IBM 4341, Harris HCX-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   3.2.3.0.053
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 propoerly 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
GHG

Train Ops. Pers   Train Operations Personnel   3.2.4.0.054
Operations personnel shall be trained in the proper use and maintenance of all operational software, policies and procedures.
SofTech
MTW

Dev. New Element   Develop New Element   3.3.0.0.000

Reqmts. Analysis   Requirements Analysis   3.3.1.0.000
AdaNet requirements analysis will be performed to better understand the requirements developed during the

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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 AdaNet 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 on going analysis based on feedback from the operational system.

System Rqmts.   3.3.1.1.057

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 AdaNet system will be developed. The requirement models address the operational capabilities, policies and procedures for using AdaNet, while the functional architecture models describe the underlying information schema necessary to support the AdaNet services and the information management system needed to process AdaNet service requests. Additionally, an assessment of NASA/JSC SEAD system will be made to determine how to integrate its services into the AdaNET system.

    SofTech

M/Deliver Rqmts   Milestone: Deliver Requirements   3.3.1.2.058

System Req. Rev.   3.3.1.3.059

    UHCL
    MTN
    SofTech
    GHG

Sustaining   Sustaining Analysis   3.3.1.4.060

During operational use of the research system, additional requirements analyses shall be conducted to determine which capabilities to introduce into the research system. Specificaly, reuse issues will be addressed to refine the policies and procedures for operating the AdaNet system. The issues, discussed in more detail in the SofTech report "Software Reuse Issues Affecting AdaNet", 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 AdaNet 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

Heading/Task	Resource	Description/Note Text	uBS Code
		used?	
		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	
		GHG	
Enh Reusable Sys		Enhance Reusable System	3.3.2.0.000
		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			3.3.2.1.062
		SofTech	
		GHG	
		MTN	
Enhance Release2			3.3.2.2.063
		SofTech	
		GHG	
		MTN	
Enhance Release3			3.3.2.3.064
		SofTech	
		GHG	
		MTN	
Enhance Release4			3.3.2.4.065
		SofTech	
		GHG	
		MTN	
Enhance Other			3.3.3.0.000
		The below activities represent policy and procedural enhancements to the research system. All plans will require approval before being implemented.	
Help Desk			3.3.3.1.067
		Develop plans and procedures for supporting Help Desk functions.	
		SofTech	
		GHG	
		MTN	
CL Services			3.3.3.2.068
		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	
		GHG	
		MTN	
Product Info.			3.3.3.3.069
		Plan the development of a system for acquiring and maintaining product information.	
		SofTech	
		GHG	
		MTN	
Resource Directo		Resource Directory	3.3.3.4.070
		Plan the development of a system for acquiring and maintaining Software Engineering resources (training, consultants, etc.)	
		SofTech	
		GHG	
		MTN	
Assess Technolo. --			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.

SofTech
McKay
WVU CS

Develop Sys Spec — 3.4.0.0.072

Based on the research findings during the evaluation of prototype operations and other trade studies, a System Specification shall be prepared and delivered.

SofTech
GHG
MTN

Develop. Mgmt — 3.5.0.0.073

SofTech

Develop. Travel — 3.6.0.0.074

SofTech

Develop. ODC — 3.7.0.0.075

ODCs to support Development are as follows:

Item Description	Cost/Year	Total Cost
FEDEX	$ 150	$ 300
Xeroxing, Printing	1500	3000
Long Distance	1000	2000
Computer Time	2250	4500

		$9800

SofTech

Operations — 4.0.0.0.000

Maintain Inform. — Maintain Information — 4.1.0.0.000

Gen Info Maint. — Maintain General Information — 4.1.1.0.078
- Maintain Conference Information
Maintain a database of current conference information

- Maintain Contracts Information
Maintain a database of current RFPs and contract awards through monitoring the Commerce Business Daily as well as other print sources available onsite.

- Maintain News Information
Includes scanning publications identified in News document generation information for pertinent information and maintaining a current database.

- Maintain Products Information
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.

- Maintain Publications Information
Includes identifying citations to publications and identifying and obtaining print or electronic copies of

Heading/Task	Resource	Description/Note Text	WBS Code
		non-copyrighted standards, guidelines, delines, or newsletters and maintaining this information in a database.	
		- 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 in-house for applicable information for each file and maintaining this information in a database.	

		- Maintain Training Information
		Includes sorting training/education information from that received inhouse, extracting and entering it into a database.
		    MTN
		    WVU CS
		    IFB	

Reusable S/W Mnt		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.
		
		- Maintain Reusable Software Componenets Library
		Includes updating existing components in the reusable software library system in accordance with standard operating procedures as well as acquiring and cataloging new components.
		    MTN
		    WVU CS
			4.1.2.0.079

Physical Lib Mnt		Maintain Physical Library 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. IFB	4.1.3.0.080

Qual. Meas. Rep.		Report Quality Measures
		- Perform Quality Measures
		Determine timeliness, completeness, and accuracy of ASV2 information in accordance with standard procedures.
		
		- Prepare and Distribute Report
		Combine all statistics in a summary report on a monthly basis and distribute as required.
		
		    MTN
		    IFB
			4.1.4.0.081

Support Users			4.2.0.0.000
Register Users		- Distribute Information Includes the distribution of AdaNet information and AdaNet account applications to potential users. - 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. - 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	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 item 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.

                        MTN
Support Users   4.2.2.0.084
 - Distribute Output Requests
User Services will provide users with hardcopies or disks
containing information found on-line. On-line documents
may be queued 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 problems 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 visability 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 Tri-Ada 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.

Heading/Task Resource	Description/Note Text	WBS Code

- Operate Software Engineers' Help Desk
A "Help Desk" will be operated to assist users to find
needed information that is not contained on-line.
Requests for non-ASV2 information will be handled
following the "Non-ASV2 Information Request Procedures"
approved 9/89. A search to find the information will
begin within the AdaNet in-house library. If the
information is not found in-house, various AdaNet
employees and/or consultants will be contacted for their
input. Requested information will be forwarded to the
requestor on the requested media.

      HTN
      IFB
      StrictBusi

Maint. User Gde   Maintain User Guides As Required   4.2.3.0.085
- 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.

- Develop User Guide Supplements As Required
Feedback from users indicates the desirability of certain
user guide supplements dealing with specific topics such
as network access, customizing menus, and/or specific
segments of the on-line service.

-Develop New User Guides As Required
New user guides will be required for each major
enhancement of the existing service and for any
independent subsystems that may be developed.

      HTN
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.

      HTN
Usage Data Repor   Report Usage Data   4.2.5.0.087
- 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

Heading/Task	Resource	Description/Note Text		WBS Code

project team members. Participate in planning the
Software Engineering Help Desk.

- 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.

- 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 whom 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.

HTH
VVU OCT

Maintain Systems   4.3.0.0.000

Install Hardware   4.3.1.0.089
  - Install SPX-50
Install multiplexor interface between Data General
computers and wide area telecommunications networks. This
device will allow more serial asynchronous connectivity
for AdaNet 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 AdaNet MV2000 and MV8000 II computers for file sharing
and user communications.

- Install 2gb 8mm Tape Backup
This device will provide a more efficient disk backup
system saving on system down time and personal service
requirements.

- Install EOC+ PC Hardware
This personal computer hardware will enable advanced
monitoring of AdaNet 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 MV2000s
These additional disk drives will permit the MV2000s to
have value for the AdaNet project. Currently, the MV2000s
have 1 38mb disk drive, which when loaded with AOS/VS and
CEO systems software would have very little room for user
files. The additional disk space is necessary given the
AdaNet environment.

- Install new hardware as required
Arrange shipping to West Virginia and install Teradata
machine. Install other new hardware as required.
HTH

Install Software   4.3.2.0.090
  - 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 AdaNet

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Heading/Task Resource	Description/Note Text	WBS Code
system.		
MTN		
Operate CL node	- Participate in Operating CL Node As Required Participate in operating telecommunications node(s) and/or computer systems located in the Clear Lake area as required.	4.3.3.0.091
MTN		
Operate WV Node	- 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 reallocating 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 Telecommunicaitons 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 Telecommunicaitons Division keeps its personnel well trained on the various systems required for the AdaNet Service. This training is necessary for propoer 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.	4.3.4.0.092

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Heading/Task	Resource	Description/Note Text		WBS Code
		Vendors of professional development in targeted areas are identified through literature or professional contacts/referrals.		

Arrangements are made for AdaNet Systems and Telecommunications staff to engage in professional development.

- Provide User Training
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.

- Monitor Hardware Performance
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 documentaiton. 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.

- Operate and Maintain Teradata System
Operate the Teradata database platform to be located in the AdaNet Computer Center in Morgantown, including physical security, operator functions, and telecommunications links.

MTN
Operate Telecomm — 4.3.5.0.093
- Maintain Internet Links
Operate and maintain TCPIP routing devices, modems or data service units, maintain telecommuncations lines, systems software, and ethernet networks necessary for connection to Internet.

- Maintain Telenet Links
Operate and maintain X.25 packet assembler/disassembler, modems, maintain telecommunications lines, and network connections necessary for connection to Telenet.

- Maintain Futurecom Network
Operate and maintain switched packet exchange and servers, modems, maintain telecommunications lines and network connections necessary for connection to MountainNet.

- Monitor Telecommunications Performance
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.

MTN
Operations Mgmt. — 4.4.0.0.000

Coor Trav&Rep Do   Coordinate travl arrange.&reports — 4.4.1.0.095
Make travel arrangements for all MountainNet project staff. Prepare travel itinaries and deliver to travelor. 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.

MTN
Proc Gds&Serv AR   Procure goods/services as required — 4.4.2.0.096

Heading/Task	Resource	Description/Note Text	UBS Code
		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,Mon&Neg Cnt		Prep/monitor/negotiate-contrts/sub 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.	4.4.3.0.097
	MTN		
Cost Acct.		Account for & invoice project Compile all operating, travel, payroll, subcontract, consultant, and other costs using the DCAA approved accounting system. Maintain hardcopy documentation of all costs as required by Federal Acquisition Regulations. Prepare and transmit invoices to UHCL for all incurred costs. Document incurred costs as requested by UHCL. Participate in informal and formal audits as required. Resolve questioned costs as required. Participate in formal training as required.	4.4.4.0.098
	MTN		
Est,Rev,&UD P/P		Estab/rev/update policies/proced. 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.	4.4.5.0.099
	MTN		
Operat. Travel			4.5.0.0.101
	MTN		
Operations ODC			4.6.0.0.102
	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 AdaNet products and services are reaching the appropriate clients This activity commences immediately with the evaluation of the existing AdaNet system and continues interactively upon the release of each major AdaNet enhancement.	5.0.0.0.000
Define Data		Define Data to be Collected Define which features of the operational AdaNet 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	5.1.0.0.104

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Heading/Task	Resource	Description/Note Text	UBS Code

data that includes the specific data formats required from each data source.

GHG
JStaples
Grasso

Collect Data   5.2.0.0.105
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.

GHG
Grasso

Summarize Data   5.3.0.0.106
Assemble these data into useful categories by feature for analysis.

GHG
Grasso

Analyze Data   5.4.0.0.107
Analyze the data collected relevent 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.

GHG
JStaples

Evaluation Mgmt   5.5.0.0.108
Project direction, cost accounting, for evaluation.

GHG

Eval. Travel   5.6.0.0.109
Travel associated with AdaNet evaluation team.

GHG

Evalution ODC   5.7.0.0.110
Includes expenses for document reproduction.

GHG

End Project   6.0.0.0.111

4.   Deliverables

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

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

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.

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Summary Presentation
of
AdaNet Monthly Costs/Performance/Status Report
For the Month Ending _____

Subcontractor _____ Project Director _____

Research Activity Title _____

_____

Summary Cost and Performance Information

Percent Completed	Cost Estimates for Previous Month	Cumulative Cost Estimates	Forecasted Cost Current Month

Status Report Overall Summary

Technical Status

Technical Problems

Projected Activities

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

SOFTech

Work Break Down Title _____ WBS NO. _____

<u>Technical Status</u>

<u>Technical Problems</u>

<u>Projected Activities/ Accomplishments</u>

Figure 4-1b   **Monthly Status Report by WBS**

SOFTECH

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

				CUMULATIVE		
Work Breakdown Elements Short Title	WBS NO.	Scheduled/Actual Start Date	Scheduled/ Actual End Date	Percent Completed	Actual Effort	Actual Cost

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

Table 4-1   Explanation of Terminology

I.   Percentage Completion of Work Breakdown Elements

       An estimate of the percentage completion of each work breakdown elements 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 the 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
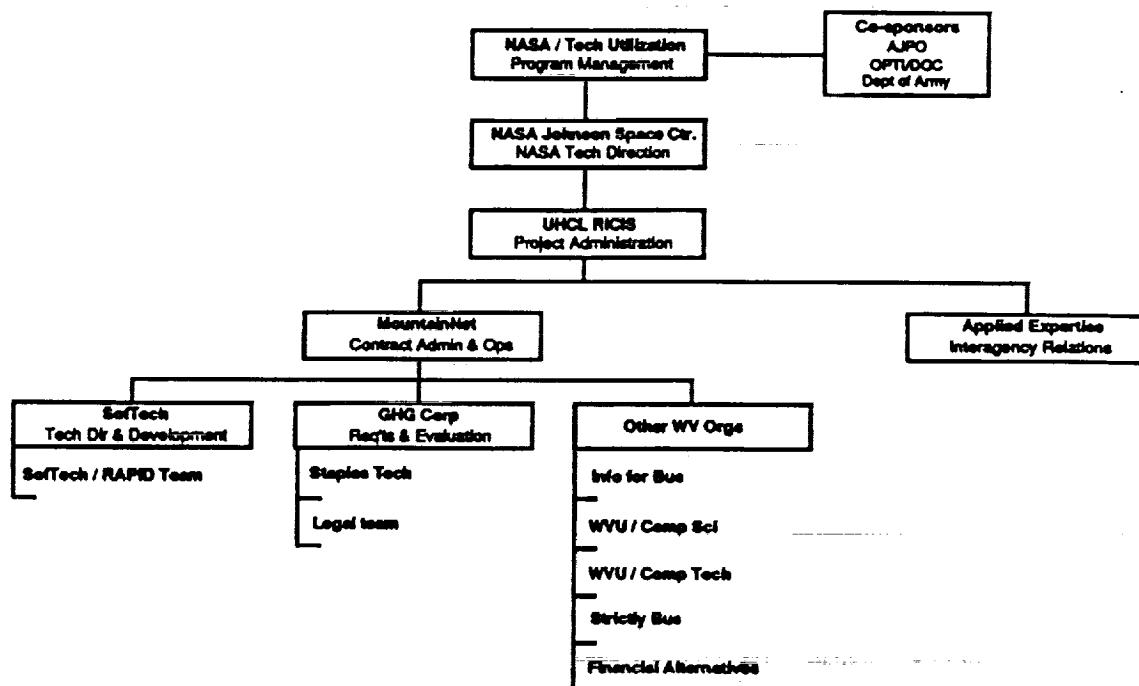
Figure 5-1   AdaNET Contracting Organization

AdaNET <u>Technical</u> Organization
Reporting Structure
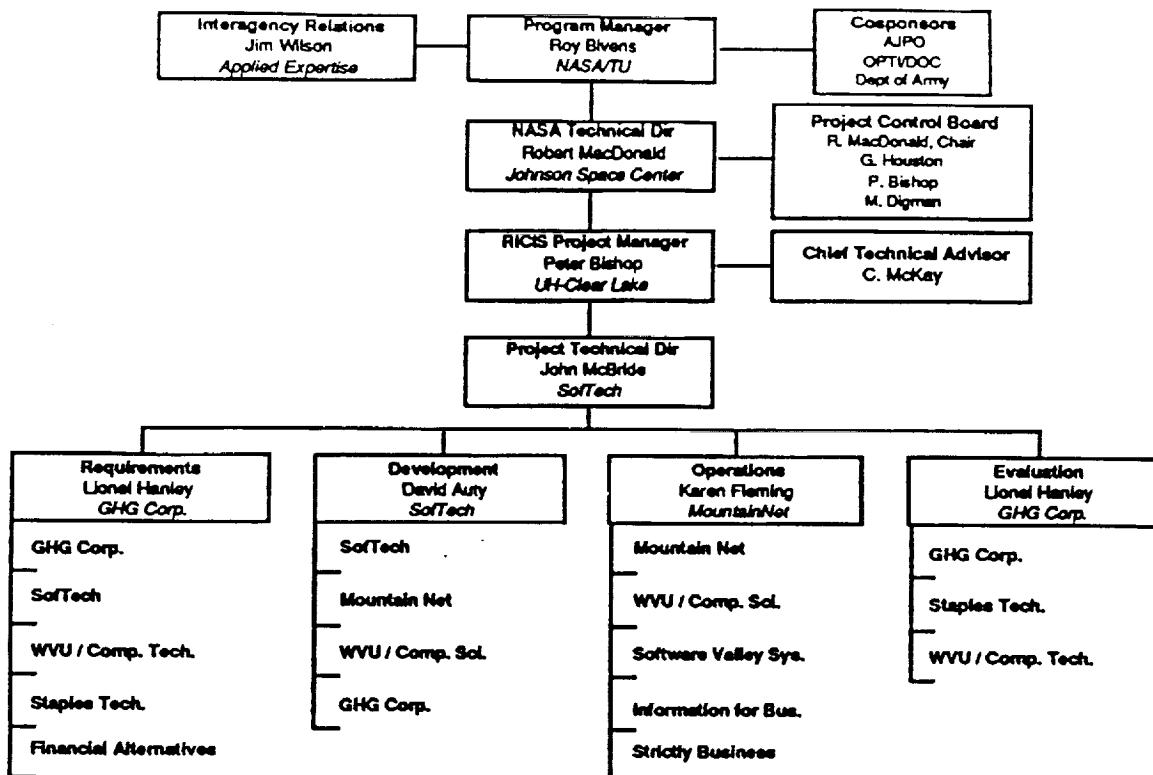
Figure 5-2   AdaNET Technical Organization

6.   Schedule

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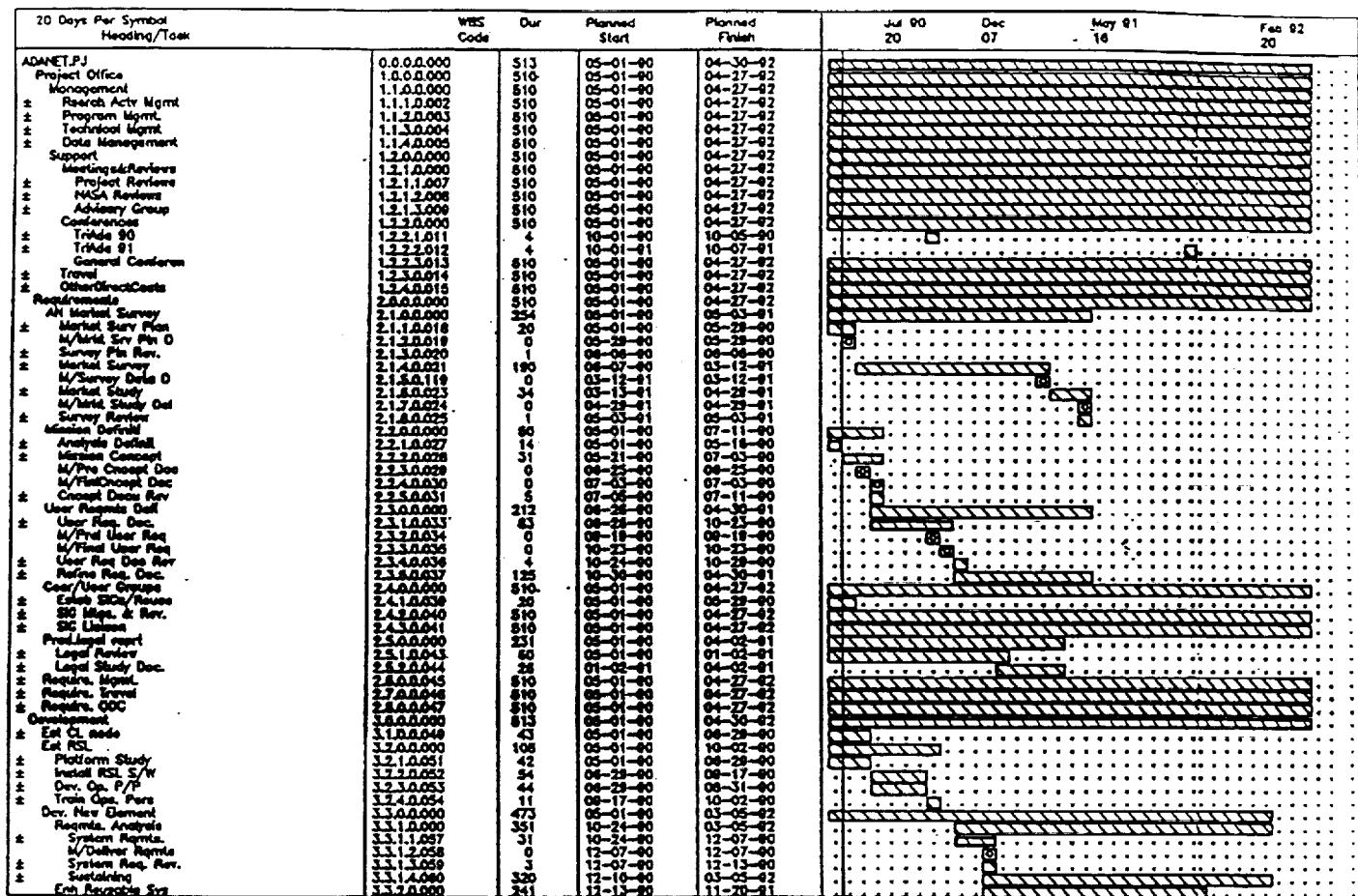
Figure 6-1   AdaNET R & D Schedule
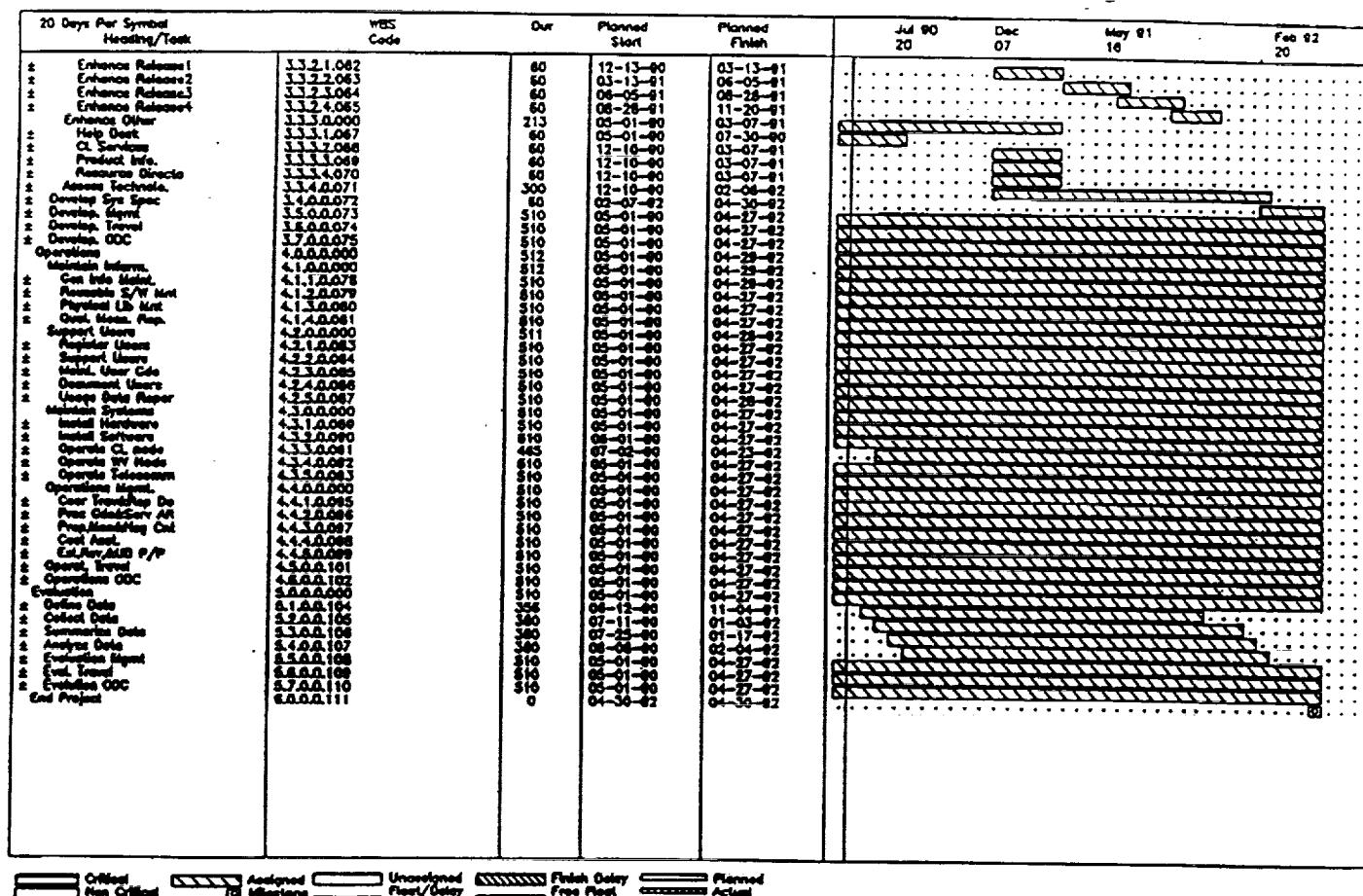
Figure 6-1   AdaNET R & D Schedule, cont.

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*

Heading/Task	WBS Code	Total Hours	Total Cost
ADANET.PJ	0.0.0.0.000	140074	6559161.33
Project Office	1.0.0.0.000	27825	1612752.91
Requirements	2.0.0.0.000	10935	509109.53
Development	3.0.0.0.000	25964	1826260.78
Operations	4.0.0.0.000	68121	2253066.11
Evaluation	5.0.0.0.000	7229	357971.99

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Table 7-2   *Project Hours and Cost, Second Level*

Heading/Task	WBS Code	Total Hours	Total Cost
ADANET.PJ	0.0.0.0.000	140074	6559161.33
Project Office	1.0.0.0.000	27825	1612752.91
Management	1.1.0.0.000	25029	937253.26
Support	1.2.0.0.000	2796	675499.66
Requirements	2.0.0.0.000	10935	509109.53
AN Market Survey	2.1.0.0.000	2598	120518.00
Mission Definiti	2.2.0.0.000	752	38317.64
User Reqmts Defi	2.3.0.0.000	3280	153331.90
Coor/User Groups	2.4.0.0.000	1120	48854.40
Prod.legal reprt	2.5.0.0.000	700	37181.50
Require. Mgmt	2.6.0.0.045	2405	104906.10
Require. Travel	2.7.0.0.046	40	4000.00
Require. ODC	2.8.0.0.047	40	2000.00
Development	3.0.0.0.000	25964	1826260.78
Est CL node	3.1.0.0.049	397	10181.39
Est RSL	3.2.0.0.000	2124	135737.88
Dev. New Element	3.3.0.0.000	18503	1280233.29
Develop Sys Spec	3.4.0.0.072	2520	169592.41
Develop. Mgmt	3.5.0.0.073	2340	170515.81
Develop. Travel	3.6.0.0.074	40	50000.00
Develop. ODC	3.7.0.0.075	40	10000.00
Operations	4.0.0.0.000	68121	2253066.11
Maintain Inform.	4.1.0.0.000	27800	509261.05
Support Users	4.2.0.0.000	16045	362321.90
Maintain Systems	4.3.0.0.000	10286	178527.12
Operations Mgmt	4.4.0.0.000	13910	193956.04
Operat. Travel	4.5.0.0.101	40	76000.00
Operations ODC	4.6.0.0.102	40	933000.00
Evaluation	5.0.0.0.000	7229	357971.99
Define Data	5.1.0.0.104	682	35758.50
Collect Data	5.2.0.0.105	1560	79786.20
Summarize Data	5.3.0.0.106	1560	79786.20
Analyze Data	5.4.0.0.107	1944	87442.24
Evaluation Mgmt	5.5.0.0.108	1403	61198.86
Eval. Travel	5.6.0.0.109	40	12000.00
Evaluation ODC	5.7.0.0.110	40	2000.00

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Table 7-3   Project Hours and Cost by Resource

Heading/Task	Resource	WBS Code	Total Hours	Total Cost
ADANET.PJ		0.0.0.0.000	140074	6559161.33
Project Office		1.0.0.0.000	27825	1612752.91
Management		1.1.0.0.000	25029	937253.26
Rserch Actv Mgmt		1.1.1.0.002	12304	398692.09
	UHCL		4784	123762.08
	AE		7520	274930.01
Program Mgmt.		1.1.2.0.003	6880	123840.00
	MTN		6880	123840.00
Technical Mgmt		1.1.3.0.004	5645	411351.17
	SofTech		5645	411351.17
Data Management		1.1.4.0.005	200	3370.00
	IFB		200	3370.00
Support		1.2.0.0.000	2796	675499.66
Meetings&Reviews		1.2.1.0.000	2212	207660.84
Project Reviews		1.2.1.1.007	1170	79407.90
	MTN		0	0.00
	SofTech		970	70683.90
	GHG		200	8724.00
NASA Reviews		1.2.1.2.008	162	11804.94
	SofTech		162	11804.94
	MTN		0	0.00
	GHG		0	0.00
Advisory Group		1.2.1.3.009	880	116448.00
	MTN		0	0.00
	SofTech		200	14574.00
	GHG		200	8724.00
	Adv. Grp.		480	93150.00
Conferences		1.2.2.0.000	384	26110.08
TriAda 90		1.2.2.1.011	192	13055.04
	MTN		0	0.00
	SofTech		160	11659.20
	GHG		32	1395.84
	UHCL		0	0.00
TriAda 91		1.2.2.2.012	192	13055.04
	MTN		0	0.00
	SofTech		160	11659.20
	GHG		32	1395.84
	UHCL		0	0.00
General Conferen		1.2.2.3.013	0	0.00
Travel		1.2.3.0.014	200	196730.00
	MTN		40	32000.00
	SofTech		40	30000.00
	GHG		40	50000.00
	UHCL		40	49680.00
	AE		40	35050.00

Heading/Task	Resource	WBS Code	Total Hours	Total Cost
OtherDirectCosts		1.2.4.0.015	0	244998.73
	MTN		0	0.00
	SofTech		0	61000.00
	UHCL		0	93238.73
	GHG		0	10000.00
	AE		0	80760.00
Requirements		2.0.0.0.000	10935	509109.53
AN Market Survey		2.1.0.0.000	2598	120518.00
Market Surv Plan		2.1.1.0.018	208	9376.48
	GHG		194	8462.28
	JStaples		14	914.20
M/Mrkt Srv Pln D		2.1.2.0.019	0	0.00
Survey Pln Rev.		2.1.3.0.020	8	348.96
	GHG		8	348.96
Market Survey		2.1.4.0.021	2050	95140.00
	GHG		1670	72845.40
	Dyer/FA		380	22294.60
M/Survey Data D		2.1.5.0.119	0	0.00
Market Study		2.1.6.0.023	324	15303.60
	GHG		270	11777.40
	JStaples		54	3526.20
M/Mrkt Study Del		2.1.7.0.024	0	0.00
Survey Review		2.1.8.0.025	8	348.96
	GHG		8	348.96
Mission Definiti		2.2.0.0.000	752	38317.64
Analysis Definit		2.2.1.0.027	180	8987.50
	GHG		130	5670.60
	SofTech		27	1967.49
	Dyer/FA		23	1349.41
Mission Concept		2.2.2.0.028	500	25487.50
	GHG		350	15267.00
	SofTech		100	7287.00
	Dyer/FA		50	2933.50
M/Pre Cncept Doc		2.2.3.0.029	0	0.00
M/FinlCncept Doc		2.2.4.0.030	0	0.00
Cncept Docu Rev		2.2.5.0.031	72	3842.64
	GHG		48	2093.76
	SofTech		24	1748.88
User Reqmts Defi		2.3.0.0.000	3280	153331.90
User Req. Doc.		2.3.1.0.033	1140	52581.30
	GHG		1006	43881.72
	SofTech		59	4299.33
	Dyer/FA		75	4400.25
M/Prel User Req		2.3.2.0.034	0	0.00
M/Final User Req		2.3.3.0.035	0	0.00
User Req Doc Rev		2.3.4.0.036	96	5123.52
	GHG		64	2791.68
	SofTech		32	2331.84
Refine Req. Doc.		2.3.5.0.037	2044	95627.08
	GHG		1752	76422.24
	SofTech		146	10639.02
	Dyer/FA		146	8565.82

Heading/Task	Resource	WBS Code	Total Hours	Total Cost
Coor/User Groups		2.4.0.0.000	1120	48854.40
Estab SIGs/Reuse		2.4.1.0.039	200	8724.00
	GHG		200	8724.00
SIG Mtgs. & Rev.		2.4.2.0.040	200	8724.00
	GHG		200	8724.00
SIG Liaison		2.4.3.0.041	720	31406.40
	GHG		720	31406.40
Prod.legal reprt		2.5.0.0.000	700	37181.50
Legal Review		2.5.1.0.043	300	18404.00
	GHG		200	8724.00
	LegalCons		100	9680.00
Legal Study Doc.		2.5.2.0.044	400	18777.50
	GHG		375	16357.50
	LegalCons		25	2420.00
Require. Mgmt.		2.6.0.0.045	2405	104906.10
	GHG		2405	104906.10
Require. Travel		2.7.0.0.046	40	4000.00
	GHG		40	4000.00
Require. ODC		2.8.0.0.047	40	2000.00
	GHG		40	2000.00
Development		3.0.0.0.000	25964	1826260.78
Est CL node		3.1.0.0.049	397	10181.39
	MTN		344	6319.28
	SofTech		53	3862.11
Est RSL		3.2.0.0.000	2124	135737.88
Platform Study		3.2.1.0.051	269	14688.03
	SofTech		101	7359.87
	GHG		168	7328.16
Install RSL S/W		3.2.2.0.052	269	19602.03
	SofTech		269	19602.03
Dev. Op. P/P		3.2.3.0.053	1162	79526.94
	SofTech		986	71849.82
	GHG		176	7677.12
Train Ops. Pers		3.2.4.0.054	424	21920.88
	SofTech		248	18071.76
	MTN		176	3849.12
Dev. New Element		3.3.0.0.000	18503	1280233.29
Reqmts. Analysis		3.3.1.0.000	5119	365533.54
System Rqmts.		3.3.1.1.057	927	67550.49
	SofTech		927	67550.49
M/Deliver Rqmts		3.3.1.2.058	0	0.00
System Req. Rev.		3.3.1.3.059	96	6995.52
	UHCL		0	0.00
	MTN		0	0.00
	SofTech		96	6995.52
	GHG		0	0.00
Sustaining		3.3.1.4.060	4096	290987.53
	SofTech		3840	279820.81
	GHG		256	11166.72

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Heading/Task	Resource	WBS Code	Total Hours	Total Cost
Enh Reusable Sys		3.3.2.0.000	8348	572800.82
Enhance Release1		3.3.2.1.062	1455	102499.11
	SofTech		1356	98811.72
	GHG		72	3140.64
	MTN		27	546.75
Enhance Release2		3.3.2.2.063	2297	156718.66
	SofTech		1954	142387.99
	GHG		316	13783.92
	MTN		27	546.75
Enhance Release3		3.3.2.3.064	2298	156791.53
	SofTech		1955	142460.86
	GHG		316	13783.92
	MTN		27	546.75
Enhance Release4		3.3.2.4.065	2298	156791.53
	SofTech		1955	142460.86
	GHG		316	13783.92
	MTN		27	546.75
Enhance Other		3.3.3.0.000	496	29916.12
Help Desk		3.3.3.1.067	112	6146.04
	SofTech		58	4226.46
	GHG		39	1701.18
	MTN		15	218.40
CL Services		3.3.3.2.068	96	5591.52
	SofTech		48	3497.76
	GHG		48	2093.76
	MTN		0	0.00
Product Info.		3.3.3.3.069	144	9089.28
	SofTech		96	6995.52
	GHG		48	2093.76
	MTN		0	0.00
Resource Directo		3.3.3.4.070	144	9089.28
	SofTech		96	6995.52
	GHG		48	2093.76
	MTN		0	0.00
Assess Technolo.		3.3.4.0.071	4540	311982.81
	SofTech		3840	279820.81
	McKay		100	5000.00
	WVU CS		600	27162.00
Develop Sys Spec		3.4.0.0.072	2520	169592.41
	SofTech		2040	148654.81
	GHG		480	20937.60
	MTN		0	0.00
Develop. Mgmt		3.5.0.0.073	2340	170515.81
	SofTech			2340	170515.81
Develop. Travel		3.6.0.0.074	40	50000.00
	SofTech		40	50000.00
Develop. ODC		3.7.0.0.075	40	10000.00
	SofTech		40	10000.00
Operations		4.0.0.0.000	68121	2253066.11

Heading/Task	Resource	WBS Code	Total Hours	Total Cost
Maintain Inform.		4.1.0.0.000	27800	509261.05
Gen Info Maint.		4.1.1.0.078	12476	216607.32
	MTN		2700	51759.00
	WVU CS		416	18832.32
	IFB		9360	146016.00
Reusable S/W Mnt		4.1.2.0.079	6688	156000.97
	MTN		6272	137168.65
	WVU CS		416	18832.32
Physical Lib Mnt		4.1.3.0.080	5624	87734.40
	IFB		5624	87734.40
Qual. Meas. Rep.		4.1.4.0.081	3012	48918.36
	MTN		308	6735.96
	IFB		2704	42182.40
Support Users		4.2.0.0.000	16045	362321.90
Register Users		4.2.1.0.083	1320	17120.40
	MTN		1320	17120.40
Support Users		4.2.2.0.084	6453	115128.70
	MTN		5429	84149.50
	IFB		832	12979.20
	StrictBusi		192	18000.00
Maint. User Gde		4.2.3.0.085	1088	18071.68
	MTN		1088	18071.68
Document Users		4.2.4.0.086	1368	18043.92
	MTN		1368	18043.92
Usage Data Repor		4.2.5.0.087	5816	193957.20
	MTN		1240	22357.20
	WVU OCT		4576	171600.00
Maintain Systems		4.3.0.0.000	10286	178527.12
Install Hardware		4.3.1.0.089	1404	24008.40
	MTN		1404	24008.40
Install Software		4.3.2.0.090	1294	26708.16
	MTN		1294	26708.16
Operate CL node		4.3.3.0.091	1820	30776.20
	MTN		1820	30776.20
Operate WV Node		4.3.4.0.092	4052	67141.64
	MTN		4052	67141.64
Operate Telecomm		4.3.5.0.093	1716	29892.72
	MTN		1716	29892.72
Operations Mgmt.		4.4.0.0.000	13910	193956.04
Coor Trav&Rep Do		4.4.1.0.095	1998	21898.08
	MTN		1998	21898.08
Proc Gds&Serv AR		4.4.2.0.096	3768	56783.76
	MTN		3768	56783.76
Prep,Mon&Neg Cnt		4.4.3.0.097	2210	29680.30
	MTN		2210	29680.30
Cost Acct.		4.4.4.0.098	4704	69148.80
	MTN		4704	69148.80
Est,Rev,&UD P/P		4.4.5.0.099	1230	16445.10
	MTN		1230	16445.10

Heading/Task	Resource	WBS Code	Total Hours	Total Cost
Operat. Travel		4.5.0.0.101	40	76000.00
	MTN		40	76000.00
Operations ODC		4.6.0.0.102	40	933000.00
	MTN		40	933000.00
Evaluation		5.0.0.0.000	7229	357971.99
Define Data		5.1.0.0.104	682	35758.50
	GHG		310	13522.20
	JStaples		62	4048.60
	Grasso		310	18187.70
Collect Data		5.2.0.0.105	1560	79786.20
	GHG		780	34023.60
	Grasso		780	45762.60
Summarize Data		5.3.0.0.106	1560	79786.20
	GHG		780	34023.60
	Grasso		780	45762.60
Analyze Data		5.4.0.0.107	1944	87442.24
	GHG		1822	79475.64
	JStaples		122	7966.60
Evaluation Mgmt		5.5.0.0.108	1403	61198.86
	GHG		1403	61198.86
Eval. Travel		5.6.0.0.109	40	12000.00
	GHG		40	12000.00
Evalution ODC		5.7.0.0.110	40	2000.00
	GHG		40	2000.00
End Project		6.0.0.0.111	0	0.00

Table 7-4   *Project Costs by Fiscal Year*

Heading/Task	WBS Code	1990 Total Cost	1991 Total Cost	1992 Total Cost
Project Office	1.0.0.0.000			
Management	1.1.0.0.000			
Rserch ActvMgmt	1.1.1.0.002	114100.19	206014.24	78577.66
Program Mgmt.	1.1.2.0.003	35251.20	63648.00	24940.80
Technical Mgmt	1.1.3.0.004	117524.74	212197.45	81628.98
Data Management	1.1.4.0.005	970.56	1752.40	647.04
		267846.69	483612.08	185794.48
Support	1.2.0.0.000			
Meetings&Reviews	1.2.1.0.000			
Project Reviews	1.2.1.1.007	23499.07	42428.88	13479.95
NASA Reviews	1.2.1.2.008	3357.85	6062.78	2384.31
Advisory Group	1.2.1.3.009	41083.29	73246.66	2118.06
		67940.21	121738.32	17982.31

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Heading/Task	WBS Code	1990 Total Cost	1991 Total Cost	1992 Total Cost
Conferences	1.2.2.0.000			
TriAda 90	1.2.2.1.011	13055.04		
TriAda 91	1.2.2.2.012		13055.04	
General Conferen	1.2.2.3.013			-
		13055.04	13055.04	0.00
Travel	1.2.3.0.014	56658.24	102299.60	37772.16
OtherDirectCosts	1.2.4.0.015	244998.73		
		301656.97	102299.60	37772.16
Requirements	2.0.0.0.000			
AN Market Survey	2.1.0.0.000			
Market Surv Plan	2.1.1.0.018	9376.48		
M/Mrkt Srv Pln D	2.1.2.0.019			
Survey Pln Rev.	2.1.3.0.020	348.96		
Market Survey	2.1.4.0.021	59141.13	35998.87	
M/Survey Data D	2.1.5.0.119			
Market Study	2.1.6.0.023		15303.60	
M/Mrkt Study Del	2.1.7.0.024			
Survey Review	2.1.8.0.025		348.96	
		68866.57	51651.43	0.00
Mission Definiti	2.2.0.0.000			
Analysis Definit	2.2.1.0.027	8987.50		
Mission Concept	2.2.2.0.028	25487.50		
M/Pre Cncept Doc	2.2.3.0.029			
M/FinlCncept Doc	2.2.4.0.030			
Cncept Docu Rev	2.2.5.0.031	3842.64		
		38317.64	0.00	0.00
User Reqmts Defi	2.3.0.0.000			
User Req. Doc.	2.3.1.0.033	52581.30		
M/Prel User Req	2.3.2.0.034			
M/Final User Req	2.3.3.0.035			
User Req Doc Rev	2.3.4.0.036	5123.52		
Refine Req. Doc.	2.3.5.0.037	13896.32	81730.76	
		71601.14	· 81730.76	0.00

Heading/Task	WBS Code	1990 Total Cost	1991 Total Cost	1992 Total Cost
Coor/User Groups	2.4.0.0.000			
Estab SIGs/Reuse	2.4.1.0.039	8724.00		
SIG Mtgs. & Rev.	2.4.2.0.040	2512.51	4536.48	1675.01
SIG Liaison	2.4.3.0.041	12562.56	18843.84	
		23799.07	23380.32	1675.01
Prod.legal reprt	2.5.0.0.000			
Legal Review	2.5.1.0.043	17217.54	1186.46	
Legal Study Doc.	2.5.2.0.044		18777.50	
		17217.54	19963.96	0.00
Require. Mgmt.	2.6.0.0.045	30150.14	54437.76	20318.20
Require. Travel	2.7.0.0.046	1152.00	2080.00	768.00
Require. ODC	2.8.0.0.047	576.00	1040.00	384.00
		31878.14	57557.76	21470.20
Development	3.0.0.0.000			
Est CL node	3.1.0.0.049	10181.39		
		10181.39	0.00	0.00
Est RSL	3.2.0.0.000			
Platform Study	3.2.1.0.051	14688.03		
Install RSL S/W	3.2.2.0.052	19602.03		
Dev. Op. P/P	3.2.3.0.053	79526.94		
Train Ops. Pers	3.2.4.0.054	21920.88		
		135737.88	0.00	0.00
Dev. New Element	3.3.0.0.000			
Reqmts. Analysis	3.3.1.0.000			
System Rqmts.	3.3.1.1.057	48222.45	19328.04	
M/Deliver Rqmts	3.3.1.2.058			
System Req. Rev.	3.3.1.3.059		6995.52	
Sustaining	3.3.1.4.060		228243.34	62744.19
		48222.45	254566.90	62744.19

Heading/Task	WBS Code	1990 Total Cost	1991 Total Cost	1992 Total Cost
Enh Reusable Sys	3.3.2.0.000			
Enhance Release1	3.3.2.1.062		102499.11	
Enhance Release2	3.3.2.2.063		156718.66	
Enhance Release3	3.3.2.3.064		156791.53	
Enhance Release4	3.3.2.4.065		156791.53	
		0.00	572800.82	0.00
Enhance Other	3.3.3.0.000			
Help Desk	3.3.3.1.067	6146.04		
CL Services	3.3.3.2.068		5591.52	
Product Info.	3.3.3.3.069		9089.28	
Resource Directo	3.3.3.4.070		9089.28	
		6146.04	23770.08	0.00
Assess Technolo.	3.3.4.0.071		261842.29	50140.53
		0.00	261842.29	50140.53
Develop Sys Spec	3.4.0.0.072			169592.41
Develop. Mgmt	3.5.0.0.073	50367.75	90941.76	29206.30
Develop. Travel	3.6.0.0.074	14400.00	26000.00	9600.00
Develop. ODC	3.7.0.0.075	2880.00	5200.00	1920.00
		67647.75	122141.76	210318.70
Operations	4.0.0.0.000			
Maintain Inform.	4.1.0.0.000			
Gen Info Maint.	4.1.1.0.078	61825.42	111629.23	43152.67
Reusable S/W Mnt	4.1.2.0.079	45795.46	82686.24	27519.26
Physical Lib Mnt	4.1.3.0.080	25878.53	46725.12	15130.75
Qual. Meas. Rep.	4.1.4.0.081	18776.66	21740.16	8401.54
		152276.07	262780.76	94204.22
Support Users	4.2.0.0.000			
Register Users	4.2.1.0.083	4930.68	8902.61	3287.12
Support Users	4.2.2.0.084	34172.35	61700.08	19256.27
Maint. User Gde	4.2.3.0.085	5166.37	9328.18	3577.13
Document Users	4.2.4.0.086	5166.26	9327.97	3549.69
Usage Data Repor	4.2.5.0.087	70741.20	87360.00	35856.00
		120176.86	176618.83	65526.21

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Heading/Task	WBS Code	1990 Total Cost	1991 Total Cost	1992 Total Cost
Maintain Systems	4.3.0.0.000			
Install Hardware	4.3.1.0.089	7091.71	12804.48	4112.21
Install Software	4.3.2.0.090	7608.73	13737.98	5361.45
Operate CL node	4.3.3.0.091	6831.64	17586.40	6358.16
Operate WV Node	4.3.4.0.092	19088.64	34465.60	13587.40
Operate Telecomm	4.3.5.0.093	9030.53	16305.12	4557.07
		49651.25	94899.58	33976.29
Operations Mgmt.	4.4.0.0.000			
Coor Trav&Rep Do	4.4.1.0.095	6186.70	11170.43	4540.95
Proc Gds&Serv AR	4.4.2.0.096	17360.64	31345.60	8077.52
Prep,Mon&Neg Cnt	4.4.3.0.097	9282.82	16760.64	3636.84
Cost Acct.	4.4.4.0.098	20321.28	36691.20	12136.32
Est,Rev,&UD P/P	4.4.5.0.099	4928.72	8899.07	2617.31
		58080.15	104866.94	31008.94
Operat. Travel	4.5.0.0.101	21888.00	39520.00	14592.00
Operations ODC	4.6.0.0.102	268704.00	485160.00	179136.00
		290592.00	524680.00	193728.00
Evaluation	5.0.0.0.000			
Define Data	5.1.0.0.104	31916.46	3842.04	
Collect Data	5.2.0.0.105	20212.50	55318.43	4255.26
Summarize Data	5.3.0.0.106	18084.87	55318.43	6382.90
Analyze Data	5.4.0.0.107	18579.00	64407.20	4456.04
Evaluation Mgmt	5.5.0.0.108	17587.58	31755.36	11855.92
Eval. Travel	5.6.0.0.109	3456.00	6240.00	2304.00
Evalution ODC	5.7.0.0.110	2000.00		
		111836.41	216881.46	29254.12
End Project	6.0.0.0.111			
		0.00	0.00	0.00
		1952727.27	3570838.71	1035595.34

Table 7-5   *Project Fiscal Year Hours and Cost by Resource*

Resource Name	Total Hours	Total Cost	1990 Total Hours	Total Cost	1991 Total Hours	Total Cost	1992 Total Hours	Total Cost
GHG	17642	840820.02	6579.72	314836.57	9459.56	444356.81	1602.72	81626.64
MTN	51564	1905303.26	16380.12	577166.45	26232.80	978261.32	8951.08	349875.49
UHCL	4824	266680.82	1393.92	143309.26	2516.80	90405.12	913.28	32966.43
SofTech	30063	2332946.49	5542.12	488255.91	19280.84	1447247.78	5240.04	397442.80
IFB	18720	292282.01	5391.36	84177.22	9734.40	151986.64	3594.24	56118.15
StrictBusi	192	18000.00	57.60	5400.00	104.00	9750.00	30.40	2850.00
JStaples	252	16455.60	65.60	4283.68	171.60	11205.48	14.80	966.44
WVU CS	1432	64826.64	253.44	11473.23	959.60	43441.09	218.96	9912.32
WVU OCT	4576	171600.00	1290.24	48384.00	2329.60	87360.00	956.16	35856.00
LegalCons	125	12100.00	100.00	9680.00	25.00	2420.00		
McKay	100	5000.00			100.00	5000.00		
AE	7560	390740.01	2154.24	169191.90	3889.60	159668.71	1516.16	61879.39
Adv. Grp	480	93150.00	172.80	33534.00	307.20	59616.00		
Dyer/FA	674	39543.58	405.60	23796.55	268.40	15747.03		
Grasso	1870	109712.90	668.80	39238.49	1097.20	64372.72	104.00	6101.68
	140074	6559161.33	40455.56	1952727.27	76476.60	3570838.71	23141.84	1035595.34

Table 7-6   Project Cost by Month

Heading/Task	WBS Code	May Total Cost	Jun Total Cost	Jul Total Cost	Aug Total Cost	Sep Total Cost
Project Office	1.0.0.000					
Management	1.1.0.0.000					
Rsrch Actv Mgmt	1.1.1.0.002	17431.97	16639.61	16639.61	18224.34	15054.89
Program Mgmt.	1.1.2.0.003	5385.60	5140.80	5140.80	5630.40	4651.20
Technical Mgmt	1.1.3.0.004	17955.17	17139.02	17139.02	18771.31	15506.74
Data Management	1.1.4.0.005	148.28	141.54	141.54	155.02	128.06
		40921.02	39060.98	39060.98	42781.07	35340.88
Support	1.2.0.0.000					
Meeting&Reviews	1.2.1.0.000					
Project Reviews	1.2.1.1.007	3590.14	3426.95	3426.95	3753.32	3100.57
NASA Reviews	1.2.1.2.008	513.00	489.69	489.69	536.32	443.05
Advisory Group	1.2.1.3.009	6276.61	5991.31	5991.31	6561.91	5420.71
		10379.75	9907.95	9907.95	10851.56	8964.33
Conferences	1.2.2.0.000					
TriAda 90	1.2.2.1.011					
TriAda 91	1.2.2.2.012					
General Confere	1.2.2.3.013	0.00	0.00	0.00	0.00	0.00
Travel	1.2.3.0.014	8656.12	8262.66	8262.66	9049.58	7475.74
OtherDirectCost	1.2.4.0.015	246998.73				
		253654.85	8262.66	8262.66	9049.58	7475.74
Requirements	2.0.0.0.000					
All Market Survey	2.1.0.0.000					
Market Surv Plan	2.1.1.0.018	9376.48				
H/Mrkt Srv Pln D	2.1.2.0.019					
Survey Pln Rev.	2.1.3.0.020		348.96			
M/Survey Survey	2.1.4.0.021		8520.33			
M/Survey Data D	2.1.5.0.119					
Market Study	2.1.6.0.023					
H/Mrkt Study Dat	2.1.7.0.024					
Survey Review	2.1.8.0.025					
		9376.48	8869.29	10525.12	11527.51	9522.72
Mission Definit	2.2.0.0.000					
Analysis Definit	2.2.1.0.027	8987.50	17495.15			
Mission Concept	2.2.2.0.028	6664.82		1327.53		
H/Pre Cncept Doc	2.2.3.0.029					
H/FinlCncept Doc	2.2.4.0.030					
Cncept Docu Rev	2.2.5.0.031			3842.64		
		15652.32	17495.15	5170.17	0.00	0.00
User Reqmts Defi	2.3.0.0.000					
User Req. Doc.	2.3.1.0.033					
H/Prel User Req	2.3.2.0.034		2570.79			
H/Final User Req	2.3.3.0.035					
User Req Doc Rev	2.3.4.0.036					
Refine Req. Doc.	2.3.5.0.037					
		0.00	2570.79	13496.67	14782.06	12211.27
Coor/User Groups	2.4.0.0.000					
Estab SIGs/Reuse	2.4.1.0.039	8724.00				

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Heading/Task	WBS Code	Oct Total Cost	Nov Total Cost	Dec Total Cost	Jan91 Total Cost	Feb Total Cost	Mar Total Cost	Apr Total Cost	May Total Cost
Project Office Management	1.0.0.0.000								
Rsrch Actv Mgmt	1.1.0.0.002	17431.97	15847.25	14262.52	17431.97	15847.25	16639.61	17431.97	18224.34
Program Mgmt.	1.1.2.0.003	5385.60	4896.00	4406.40	5385.60	4896.00	5140.80	5385.60	5630.40
Technical Mgmt	1.1.3.0.004	17955.17	16322.88	14690.59	17955.17	16322.88	17139.02	17955.17	18771.31
Data Management	1.1.4.0.005	148.28	134.80	121.32	148.28	134.80	141.54	148.28	155.02
		40921.02	37200.93	33480.84	40921.02	37200.93	39060.98	40921.02	42781.07
Support	1.2.0.0.000								
Meetings&Reviews	1.2.1.0.000								
Project Reviews	1.2.1.1.007	3590.14	3263.76	2937.38	3590.14	3263.76	3426.95	3590.14	3753.32
NASA Reviews	1.2.1.2.008	513.00	466.37	419.73	513.00	466.37	489.69	513.00	536.32
Advisory Group	1.2.1.3.009	6276.61	5706.01	5135.41	6276.61	5706.01	5991.31	6276.61	6561.91
		10379.75	9436.14	8492.53	10379.75	9436.14	9907.95	10379.75	10851.56
Conferences	1.2.2.0.000								
TriAda 90	1.2.2.1.011	13055.04							
TriAda 91	1.2.2.2.012								
General Confere	1.2.2.3.013								
		13055.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Travel	1.2.3.0.014	8656.12	7869.20	7082.28	8656.12	7869.20	8262.66	8656.12	9049.58
OtherDirectCosts	1.2.4.0.015	8656.12	7869.20	7082.28	8656.12	7869.20	8262.66	8656.12	9049.58
Requirements	2.0.0.0.000								
AM Market Survey	2.1.0.0.000								
Market Surv Plan	2.1.1.0.018								
M/Mrkt Srv Pln D	2.1.2.0.019								
Survey Pln Rev.	2.1.3.0.020								
Market Survey	2.1.4.0.021	11026.31	10023.92	9021.53	11026.31	10023.92	3922.33		
M/Survey Data D	2.1.5.0.119								
Market Study	2.1.6.0.023								
M/Mrkt Study Det	2.1.7.0.024						5894.72		
Survey Review	2.1.8.0.025							9408.88	348.96
		11026.31	10023.92	9021.53	11026.31	10023.92	9817.05	9408.88	348.96
Mission Definiti	2.2.0.0.000								
Analysis Definit	2.2.1.0.027								
Mission Concept	2.2.2.0.028								
M/Pre Cncept Doc	2.2.3.0.029								
M/FinlCncept Doc	2.2.4.0.030								
Cncept Docu Rev	2.2.5.0.031								
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User Reqmts Defl	2.3.0.0.000								
User Req. Doc.	2.3.1.0.033	9520.51							
M/Prel User Req	2.3.2.0.034								
M/Final User Req	2.3.3.0.035								
User Req Doc Rev	2.3.4.0.036	5123.52							
Refine Req. Doc.	2.3.5.0.037	1544.04							
		16188.06	15440.35	13896.32	16984.39	15440.35	16212.37	16109.27	0.00
Coor/User Groups	2.4.0.0.000								
Estab SIGs/Reuse	2.4.1.0.039								

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Heading/Task	WBS Code	Jun Total Cost	Jul Total Cost	Aug Total Cost	Sep Total Cost	Oct Total Cost	Nov Total Cost	Dec Total Cost	Jan92 Total Cost
Project Office	1.0-0.0.000								
Management	1.1.0.0.000								
Rsrch Actv Mgmt	1.1.1.0.002	15847.25	18224.34	17431.97	16639.61	18224.34	16639.61	17431.97	18224.34
Program Mgmt.	1.1.2.0.003	4896.00	5630.40	5385.60	5140.80	5630.40	5140.80	5385.60	5630.40
Technical Mgmt	1.1.3.0.004	16322.88	18771.31	17955.17	17139.02	18771.31	17139.02	17955.17	18771.31
Data Management	1.1.4.0.005	134.80	155.02	148.28	141.54	155.02	141.54	148.28	155.02
		37200.93	42781.07	40921.02	39060.98	42781.07	39060.98	40921.02	42781.07
Support	1.2.0.0.000								
Meetings&Reviews	1.2.1.0.000								
Project Reviews	1.2.1.1.007	3263.76	3753.32	3590.14	3426.95	3753.32	3426.95	3590.14	3753.32
NASA Reviews	1.2.1.2.008	466.37	536.32	513.00	489.69	536.32	489.69	513.00	536.32
Advisory Group	1.2.1.3.009	5706.01	6561.91	6276.61	5991.31	6561.91	5059.81	826.91	401.30
		9436.14	10851.56	10379.75	9907.95	10851.56	8976.45	4930.05	4690.95
Conferences	1.2.2.0.000								
TriAda 90	1.2.2.1.011								
TriAda 91	1.2.2.2.012								
General Conferen	1.2.2.3.013					13055.04			
		0.00	0.00	0.00	0.00	13055.04	0.00	0.00	0.00
Travel	1.2.3.0.014	7869.20	9049.58	8656.12	8262.66	9049.58	8262.66	8656.12	9049.58
OtherDirectCosts	1.2.4.0.015	7869.20	9049.58	8656.12	8262.66	9049.58	8262.66	8656.12	9049.58
Requirements	2.0-0.0.000								
All Market Survey	2.1.0.0.000								
Market Surv Plan	2.1.1.0.018								
M/Mrkt Srv Pln D	2.1.2.0.019								
Survey Pln Rev.	2.1.3.0.020								
Market Survey	2.1.4.0.021								
M/Survey Data D	2.1.5.0.119								
Market Study	2.1.6.0.023								
M/Mrkt Study Del	2.1.7.0.024								
Survey Review	2.1.8.0.025								
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mission Definiti	2.2.0.0.000								
Analysis Definit	2.2.1.0.027								
Mission Concept	2.2.2.0.028								
M/Pre Cncept Doc	2.2.3.0.029								
M/FinConcept Doc	2.2.4.0.030								
Cncept Docu Rev	2.2.5.0.031								
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User Reqmts Defi	2.3.0.0.000								
User Req. Doc.	2.3.1.0.033								
M/Prel User Req	2.3.2.0.034								
M/Final User Req	2.3.3.0.035								
User Req Doc Rev	2.3.4.0.036								
Refine Req. Doc.	2.3.5.0.037								
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coor/User Groups	2.4.0.0.000								
Estab Side/Reuse	2.4.1.0.039								
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Heading/Task	WBS Code	Feb Total Cost	Mar Total Cost	Apr Total Cost
Project Office	1.0.0.0.000			
Management	1.1.0.0.000			
Rsrch Actv Mgmt	1.1.1.0.002	15847.25	17431.97	9642.13
Program Mgmt.	1.1.2.0.003	4896.00	5385.60	3643.20
Technical Mgmt	1.1.3.0.004	16322.88	17955.17	10624.45
Data Management	1.1.4.0.005	134.80	148.28	60.66
		37200.93	40921.02	23970.44
Support	1.2.0.0.000			
Meetings&Reviews	1.2.1.0.000			
Project Reviews	1.2.1.1.007	3263.76	2715.70	157.03
NASA Reviews	1.2.1.2.008	466.37	513.00	355.61
Advisory Group	1.2.1.3.009	348.96	383.86	157.03
		4079.09	3612.56	669.67
Conferences	1.2.2.0.000			
TriAda 90	1.2.2.1.011			
TriAda 91	1.2.2.2.012			
General Conferel	1.2.2.3.013			
		0.00	0.00	0.00
Travel	1.2.3.0.014			
OtherDirectCosts	1.2.4.0.015	7869.20	8656.12	3541.14
		7869.20	8656.12	3541.14
Requirements	2.0.0.0.000			
All Market Survey	2.1.0.0.000			
Market Surv Plan	2.1.1.0.018			
M/Mrkt Srv Pln D	2.1.2.0.019			
Survey Pln Rev.	2.1.3.0.020			
Market Survey	2.1.4.0.021			
M/Survey Qata D	2.1.5.0.119			
Market Study	2.1.6.0.023			
M/Mrkt Study Del	2.1.7.0.024			
Survey Review	2.1.8.0.025			
		0.00	0.00	0.00
Mission Definitl	2.2.0.0.000			
Analysis Definit	2.2.1.0.027			
Mission Concept	2.2.2.0.028			
M/Pre Cncept Doc	2.2.3.0.029			
M/Finl Cncept Doc	2.2.4.0.030			
Cncept Docu Rev	2.2.5.0.031			
		0.00	0.00	0.00
User Reqmts Defl	2.3.0.0.000			
User Req. Doc.	2.3.1.0.033			
M/Prel User Req	2.3.2.0.034			
M/Final User Req	2.3.3.0.035			
User Req Doc Rev	2.3.4.0.036			
Refine Req. Doc.	2.3.5.0.037			
		0.00	0.00	0.00
Coor/User Groups	2.4.0.0.000			
Estab Sids/Reuse	2.4.1.0.039			

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Heading/Task	WBS Code	May Total Cost	Jun Total Cost	Jul Total Cost	Aug Total Cost	Sep Total Cost
SIG Mtgs. & Rev.	2.4.2.0.040	303.86	366.41	366.41	401.30	331.51
SIG Liaison	2.4.3.0.041	1919.28	1832.04	1832.04	2006.52	1657.56
		11027.14	2198.45	2198.45	2407.82	1989.07
Prod.legal reprt	2.5.0.0.000					
Legal Review	2.5.1.0.043	5921.87	5652.70	1455.45	1203.91	994.54
Legal Study Doc.	2.5.2.0.044					
		5921.87	5652.70	1455.45	1203.91	994.54
Require. Mgmt.	2.6.0.0.045	4606.27	4396.90	4396.90	4815.65	3978.14
Require. Travel	2.7.0.0.046	176.00	168.00	168.00	184.00	152.00
Require. ODC	2.8.0.0.047	88.00	84.00	84.00	92.00	76.00
		4870.27	4648.90	4648.90	5091.65	4206.14
Development	3.0.0.0.000					
Est CL node	3.1.0.0.049	5285.14	4896.25	0.00	0.00	0.00
		5285.14	4896.25			
Est RSL	3.2.0.0.000					
Platform study	3.2.1.0.051	7686.10	7001.93	7712.56	8447.09	3075.11
Install RSL S/W	3.2.2.0.052		367.26			
Dev. Op. P/P	3.2.3.0.053		1818.43	38186.97	39921.54	19929.92
Train Ops. Pers	3.2.4.0.054					
		7686.10	9187.63	45899.53	47968.63	23005.04
Dev. New Element	3.3.0.0.000					
Reqmts. Analysis	3.3.1.0.000					
System Rqmts.	3.3.1.1.057					
H/Deliver Rqmts	3.3.1.2.058					
System Req. Rev	3.3.1.3.059	0.00	0.00	0.00	0.00	0.00
Sustaining	3.3.1.4.060					
Enh Reusable Sys	3.3.2.0.000					
Enhance Release	3.3.2.1.062					
Enhance Release	3.3.2.2.063					
Enhance Release	3.3.2.3.064	0.00	0.00	0.00	0.00	0.00
Enhance Release	3.3.2.4.065					
Enhance Other	3.3.3.0.000					
Help Desk	3.3.3.1.067					
CL Services	3.3.3.2.068	2230.06	2128.69	1787.28	0.00	0.00
Product Info.	3.3.3.3.069					
Resource Direct	3.3.3.4.070					
		2230.06	2128.69	1787.28	0.00	0.00
Assess Technolo.	3.3.4.0.071	0.00	0.00	0.00	0.00	0.00
Develop Sys Spec	3.4.0.0.072	7695.07	7345.30	7345.30	8044.85	6645.76
Develop. Mgmt	3.5.0.0.073	2200.00	2100.00	2100.00	2300.00	1900.00
Develop. Travel	3.6.0.0.074					

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Heading/Task	WBS Code	Oct Total Cost	Nov Total Cost	Dec Total Cost	Jan91 Total Cost	Feb Total Cost	Mar Total Cost	Apr Total Cost	May Total Cost
SIG Mtgs. & Rev.	2.4.2.0.040	383.86	348.96	314.06	383.86	348.96	366.41	383.86	401.30
SIG Liaison	2.4.3.0.041	1919.28	1744.80	1570.32	1919.28	1744.80	1832.04	1919.28	2006.52
		2303.14	2093.76	1884.38	2303.14	2093.76	2198.45	2303.14	2407.82
Prod.legal reprt	2.5.0.0.000								
Legal Review	2.5.1.0.043	1151.57	1046.88	942.19	34.90	5094.82	5349.56	308.83	0.00
Legal Study Doc.	2.5.2.0.044				8024.30				
		1151.57	1046.88	942.19	8059.19	5094.82	5349.56	308.83	0.00
Requra. Mgmt.	2.6.0.0.045	4606.27	4187.52	3768.77	4606.27	4187.52	4396.90	4606.27	4815.65
Requra. Travel	2.7.0.0.046	176.00	160.00	144.00	176.00	160.00	168.00	176.00	184.00
Requra. CDC	2.8.0.0.047	88.00	80.00	72.00	88.00	80.00	84.00	88.00	92.00
		4870.27	4427.52	3984.77	4870.27	4427.52	4648.90	4870.27	5091.65
Development	3.0.0.0.000								
Est CL node	3.1.0.0.049	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Est RSL	3.2.0.0.000								
Platform Study	3.2.1.0.051								
Install RSL S/W	3.2.2.0.052								
Dev. Op. P/P	3.2.3.0.053								
Train Ops. Pers	3.2.4.0.054	1990.96							
		1990.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dev. New Element	3.3.0.0.000								
Reqmts. Analysis	3.3.1.0.000								
System Rqmts.	3.3.1.1.057								
H/Deliver Rqmts	3.3.1.2.058								
System Req. Rev	3.3.1.3.059	13151.58	43838.59	6995.52	20005.39	18186.72	19096.06	20005.39	20914.73
Sustaining	3.3.1.4.060			11821.37					
		13151.58	43838.59	29377.21	20005.39	18186.72	19096.06	20005.39	20914.73
Enh Reusable Sys	3.3.2.0.000								
Enhance Release	3.3.2.1.062								
Enhance Release	3.3.2.2.063			16430.52	37917.00	34470.00	13681.60	57863.73	60476.89
Enhance Release	3.3.2.3.064						33171.00		
Enhance Release	3.3.2.4.065								
				16430.52	37917.00	34470.00	46852.59	57863.73	60476.89
Enhance Other	3.3.3.0.000								
Help Desk	3.3.3.1.067			1211.50	2050.22	1863.84	465.96		
CL Services	3.3.3.2.068			1969.34	3332.74	3029.76	757.44		
Product Info.	3.3.3.3.069			1969.34	3332.74	3029.76	757.44		
Resource Direct	3.3.3.4.070						1980.84		
		0.00	0.00	5150.18	8715.70	7923.36		0.00	
Assess Technolo.	3.3.4.0.071			13562.59	22952.07	20665.52	21908.80	22952.07	23995.35
		0.00	0.00	13562.59	22952.07	20665.52	21908.80	22952.07	23995.35
Develop Sys Spec	3.4.0.0.072	7695.07	6995.52	6295.97	7695.07	6995.52	7345.30	7695.07	8044.85
Develop. Mgmt	3.5.0.0.073	2200.00	2000.00	1800.00	2200.00	2000.00	2100.00	2200.00	2300.00
Develop. Travel	3.6.0.0.074								

Heading/Task	WBS Code	Jun Total Cost	Jul Total Cost	Aug Total Cost	Sep Total Cost	Oct Total Cost	Nov Total Cost	Dec Total Cost	Jan92 Total Cost
SIG Mtgs. & Rev.	2.4.2.0.040	348.96	401.30	383.86	366.41	401.30	366.41	383.86	401.30
SIG Liaison	2.4.3.0.041	1744.80	2006.52	1919.28	1832.04				
		2093.76	2407.82	2303.14	2198.45	401.30	366.41	383.86	401.30
Prod.legal reprt	2.5.0.0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Legal Review	2.5.1.0.043								
Legal Study Doc.	2.5.2.0.044								
Require. Mgmt.	2.6.0.0.045	4187.52	4815.65	4606.27	4396.90	4815.65	4396.90	4606.27	4815.65
Require. Travel	2.7.0.0.046	160.00	184.00	176.00	168.00	184.00	168.00	176.00	184.00
Require. ODC	2.8.0.0.047	80.00	92.00	88.00	84.00	92.00	84.00	88.00	92.00
		4427.52	5091.65	4870.27	4648.90	5091.65	4648.90	4870.27	5091.65
Development	3.0.0.0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Est CL node	3.1.0.0.049								
Est RSL	3.2.0.0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Platform study	3.2.1.0.051								
Install RSL S/W	3.2.2.0.052								
Dev. Op. P/P	3.2.3.0.053								
Train Ops. Pers	3.2.4.0.054								
Dev. New Element	3.3.0.0.000	18186.72	20914.73	20005.39	19096.06	20914.73	19096.06	20005.39	20914.73
Reqmts. Analysis	3.3.1.0.000								
System Reqmts.	3.3.1.1.057								
N/Deliver Reqmts	3.3.1.2.058								
System Req. Rev	3.3.1.3.059								
Sustaining	3.3.1.4.060	18186.72	20914.73	20005.39	19096.06	20914.73	19096.06	20005.39	20914.73
Enh Reusable Sys	3.3.2.0.000	5207.03	60493.90	49975.78	55233.56	60493.90	34194.76		
Enhance Release	3.3.2.1.062	46321.85		6869.30					
Enhance Release	3.3.2.2.063								
Enhance Release	3.3.2.3.064								
Enhance Release	3.3.2.4.065	51528.88	60493.90	56845.08	55233.56	60493.90	34194.76	0.00	0.00
Enhance Other	3.3.3.0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Help Desk	3.3.3.1.047								
CL Services	3.3.3.2.068								
Product Info.	3.3.3.3.069								
Resource Direct	3.3.3.4.070								
Assess Technolo.	3.3.4.0.071	20865.52	23995.35	22952.07	21908.80	23995.35	21888.80	22512.07	23535.35
		20865.52	23995.35	22952.07	21908.80	23995.35	21888.80	22512.07	23535.35
Develop Sys Spec	3.4.0.0.072	6995.52	8044.85	7695.07	7345.30	8044.85	7345.30	7695.07	8044.85
Develop. Mgmt	3.5.0.0.073	2000.00	2300.00	2200.00	2100.00	2300.00	2100.00	2200.00	2300.00
Develop. Travel	3.6.0.0.074								

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Meeting/Task	WBS Code	Feb Total Cost	Mar Total Cost	Apr Total Cost
SIG Mtgs. & Rev.	2.4.2.0.040	348.96	383.86	157.03
SIG Liaison	2.4.3.0.041	348.96	383.86	157.03
Prod.legal reprt	2.5.0.0.000			
Legal Review	2.5.1.0.043			
Legal Study Doc.	2.5.2.0.044	0.00	0.00	0.00
Require. Mgmt.	2.6.0.0.045	4187.52	4606.27	2102.48
Require. Travel	2.7.0.0.046	160.00	176.00	72.00
Require. ODC	2.8.0.0.047	80.00	88.00	36.00
		4427.52	4870.27	2210.48
Development	3.0.0.0.000			
Est CL node	3.1.0.0.049	0.00	0.00	0.00
Est RSL	3.2.0.0.000			
Platform Study	3.2.1.0.051			
Install RSL S/W	3.2.2.0.052			
Dev. Op. P/P	3.2.3.0.053			
Train Ops. Pers	3.2.4.0.054	0.00	0.00	0.00
Dev. New Element	3.3.0.0.000			
Reqmts. Analysis	3.3.1.0.000			
System Rqmts.	3.3.1.1.057			
M/Deliver Rqmts	3.3.1.2.058			
System Req. Rev	3.3.1.3.059			
Sustaining	3.3.1.4.060	18186.72	3637.34	0.00
		18186.72	3637.34	0.00
Enh Reusable Sys	3.3.2.0.000			
Enhance Release	3.3.2.1.062			
Enhance Release	3.3.2.2.063			
Enhance Release	3.3.2.3.064			
Enhance Release	3.3.2.4.065	0.00	0.00	0.00
Enhance Other	3.3.3.0.000			
Help Desk	3.3.3.1.067			
CL Services	3.3.3.2.068			
Product Info.	3.3.3.3.069			
Resource Direct	3.3.3.4.070	0.00	0.00	0.00
Assess Technolo.	3.3.4.0.071	4093.10	0.00	0.00
		4093.10	0.00	0.00
Develop Sys Spec	3.4.0.0.072	45224.64	62183.88	62183.88
Develop. Mgmt	3.5.0.0.073	6995.52	6470.86	
Develop. Travel	3.6.0.0.074	2000.00	2200.00	900.00

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Heading/Task	WBS Code	May Total Cost	Jun Total Cost	Jul Total Cost	Aug Total Cost	Sep Total Cost
Develop. ODC	3.7.0.0.075	440.00	420.00	420.00	460.00	380.00
		10335.07	9865.30	9865.30	10804.85	8925.74
Operations	4.0.0.0.000					
Maintain Inform.	4.1.0.0.000					
Gen Info Maint.	4.1.1.0.078	9445.55	9016.21	9016.21	9074.89	8157.52
Reusable S/W Mnt.	4.1.2.0.079	6996.53	6678.50	6678.50	7314.55	6042.46
Physical Lib Mnt.	4.1.3.0.080	3953.66	3773.95	3773.95	4133.38	3414.53
Qual. Meas. Rep.	4.1.4.0.081	4726.39	4511.56	2849.44	1923.17	1588.70
		25122.14	23980.22	22318.10	23245.99	19203.21
Support Users	4.2.0.0.000					
Register Users	4.2.1.0.083	753.30	719.06	719.06	787.54	650.58
Support Users	4.2.2.0.084	5220.78	4983.47	4983.47	5456.08	4508.85
Maint. User Gde	4.2.3.0.085	789.31	753.43	753.43	825.18	681.67
Document Users	4.2.4.0.086	789.29	753.41	753.41	825.17	681.66
Usage Data Repor	4.2.5.0.087	11834.59	11296.66	11296.66	12372.53	10220.78
		19387.26	18506.02	18506.02	20268.50	16743.54
Maintain Systems	4.3.0.0.000					
Install Hardware	4.3.1.0.089	1083.46	1034.21	1034.21	1132.70	935.71
Install Software	4.3.2.0.090	1162.44	1109.61	1109.61	1215.28	1003.93
Operate CL node	4.3.3.0.091			1420.44	1555.72	1285.16
Operate UV Node	4.3.4.0.092	2916.32	2783.76	2783.76	3048.88	2518.64
Operate Telecomm	4.3.5.0.093	1379.66	1316.95	1316.95	1442.38	1191.53
		6541.88	6244.53	7664.97	8394.96	6934.97
Operations Mgmt.	4.4.0.0.000					
Coor TravRep Doc	4.4.1.0.095	945.19	902.23	902.23	988.15	816.30
Proc Gd&Serv AR	4.4.2.0.096	2652.32	2531.76	2531.76	2772.88	2290.64
Prep,MonReg Cnt	4.4.3.0.097	1418.21	1353.74	1353.74	1482.67	1224.82
Cost Acct.	4.4.4.0.098	3104.64	2963.52	2963.52	3245.76	2681.28
Est,Rev,Sub P/P	4.4.5.0.099	753.00	718.77	718.77	787.23	650.32
		8873.36	8470.02	8470.02	9276.69	7663.35
Operat. Travel	4.5.0.0.101	3344.00	3192.00	3192.00	3496.00	2888.00
Operations ODC	4.6.0.0.102	41052.00	39186.00	39186.00	42918.00	35454.00
		44396.00	42378.00	42378.00	46414.00	38342.00
Evaluation	5.0.0.0.000					
Define Data	5.1.0.0.104		3885.48	5828.22	6383.29	5273.15
Collect Data	5.2.0.0.105			3191.45	4893.55	4042.50
Summarize Data	5.3.0.0.106			1063.82	4893.55	4042.50
Analyze Data	5.4.0.0.107				4458.96	4706.68
Evaluation Mgmt	5.5.0.0.108	2686.99	2564.86	2564.86	2809.13	2320.58
Eval. Travel	5.6.0.0.109	528.00	504.00	504.00	552.00	456.00
Evaluation ODC	5.7.0.0.110	2000.00				
		5214.99	6954.34	13152.34	23990.49	20841.42
End Project	6.0.0.0.111	0.00	0.00	0.00	0.00	0.00
		486875.71	231277.86	264767.90	288059.28	222363.98

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Heading/Task	WBS Code	Feb Total Cost	Mar Total Cost	Apr Total Cost
Develop. ODC	3.7.0.0.075	400.00	440.00	180.00
		54620.16	71294.74	63263.88
Operations	4.0.0.0.000			
Maintain Inform.	4.1.0.0.000			
Gen Info Maint.	4.1.1.0.078	8586.86	8717.61	6527.75
Reusable S/W Mnt	4.1.2.0.079	6360.48	6268.59	579.12
Physical Lib Mnt	4.1.3.0.080	3594.24	3449.47	
Qual. Meas. Rep.	4.1.4.0.081	1672.32	1839.55	1126.94
		20213.90	20275.22	8233.81
Support Users	4.2.0.0.000			
Register Users	4.2.1.0.083	684.82	753.30	308.17
Support Users	4.2.2.0.084	4746.16	3720.18	111.07
Maint. User Gde	4.2.3.0.085	717.55	789.31	455.78
Document Users	4.2.4.0.086	717.54	789.29	428.41
Usage Data Repor	4.2.5.0.087	6720.00	7392.00	6624.00
		13586.06	13444.07	7927.43
Maintain Systems	4.3.0.0.000			
Install Hardware	4.3.1.0.089	984.96	911.09	764.51
Install Software	4.3.2.0.090	1056.77	1162.44	473.48
Operate CL node	4.3.3.0.091	1352.80	1488.08	2054.68
Operate W Node	4.3.4.0.092	2651.20	2916.32	
Operate Telecomm	4.3.5.0.093	1254.24	480.79	
		7299.97	6958.72	3292.67
Operations Mgmt.	4.4.0.0.000			
Coor Trav&Rep Do	4.4.1.0.095	859.26	945.19	803.15
Proc Gd&Serv AR	4.4.2.0.096	2411.20	241.12	
Prep Mon&Neg Cnt	4.4.3.0.097	735.96		
Cost Acct.	4.4.4.0.098	2822.40	2963.52	
Est.Rev,&IO P/P	4.4.5.0.099	684.54	392.54	
		7513.37	4542.37	803.15
Operat. Travel	4.5.0.0.101	3040.00	3344.00	1388.00
Operations ODC	4.6.0.0.102	37320.00	41052.00	16794.00
		40360.00	44396.00	18162.00
Evaluation	5.0.0.0.000			
Define Data	5.1.0.0.104			
Collect Data	5.2.0.0.105			
Summarize Data	5.3.0.0.106	26.12		
Analyze Data	5.4.0.0.107	2442.72	2686.99	1230.08
Evaluation Mgmt	5.5.0.0.108			
Eval. Travel	5.6.0.0.109	480.00	528.00	216.00
Evaluation ODC	5.7.0.0.110			
		2948.84	3214.99	1446.08
End Project	6.0.0.0.111	0.00	0.00	0.00
		222747.83	226207.29	133677.78

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