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Summary Report

WebOPS Phase I

By

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J Kathy Parker, Ph D

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May 1998

For

US Agency for International Development

Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ)

Partners International Resources Group, Winrock International,
and Harvard Institute for International Development

Subcontractors PADCO, Management Systems International, and Development Alternatives, Inc

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Tellus Institute, Urban Institute, and World Resources Institute

WebOPS Phase I Summary Report

The CNA Corporation

May 1998

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This annotated briefing (with appendices) serves as summary documentation for The CNA Corporation's (CNAC) requirements analysis of the WebOPS concept for the Office of Sustainable Development, Africa Bureau, U S Agency for International Development (USAID) The requirements analysis served as Phase I of a multi-phase design, development, testing and roll-out process

Within the WebOPS effort, CNAC's overall task is to create a web-based suite of software applications that will allow USAID Africa Bureau missions to collaborate online in planning, achieving, and judging activities with development partners

In the Phase I effort, Thomas Barnett and Kathy Parker served as USAID organizational development subject matter experts Theresa Kimble served as senior software engineer, with Bill Sims providing overall project direction

The WebOPS Project

- WebOPS project
 - CNAC conducting req 's analysis as subcontractor to IRG under G/Environ's IQC known as EPIQ
 - Work began in Nov 97 and ends May 98
- Final products include
 - Summary of January WebOPS workshop
 - WebOPS customer survey
 - Software requirements document
 - Series of analytic essays
 - Mock-up of envisioned WebOPS web site
 - This annotated briefing

The WebOPS Phase I effort was funded through Global Bureau/Center for Environment's Indefinite Quantity Contract known as EPIQ (Environmental Policy and Institutional Strengthening Indefinite Quantity Contract) International Resources Group (IRG) serves as prime contractor for EPIQ

Phase I work began in the fall of 1997 and wraps up with this publication in May of 1998

Of the final products listed, the workshop summary (*Summary of Joint CNAC-USAID WebOPS Workshop 6-8 January, 1998*, Institute for Public Research (IPR) 98-5003, February 1998) and the customer survey (*WebOPS Primer and Customer Survey*, IPR 98-5004, March 1998) have already been published. The complete list of survey questions is likewise included in this document in Appendix A. A revised version is expected to be posted on Africa Bureau's Results Framework Network (RFNET) in the near future.

The design requirements is also being published as a separate document (*Design Requirements for WebOPS*, IPR 98-5041, May 1998). This document is summarized later in this briefing.

Abstracts of the analytic essays on USAID's "information culture" and how WebOPS could serve to improve that culture are included in this document in Appendix B. They will also be posted on RFNET in the near future.

Finally, the WebOPS web-site mock-up is also considered to be a final deliverable. The web-site is currently located on CNAC's intranet. It will serve as the nucleus for the web and software development envisioned in Phase II of the work.

January Workshop Participants

- Tony Pryor (AFR/SD/PSGE)
- Tim Resch (AFR/SD/PSGE)
- Mike McGahuey (AFR/SD/PSGE)
- Paul Bartel (AFR/SD/PSGE)
- Fred Swartzendruber (AFR/SD/PSGE)
- Joseph Gueron (USAID/IRM)
- Darrell Owen (USAID/IRM)
- David McCloud (USAID/AFR)
- Drew Lent (Management Systems International)
- John Adair (AMEX)
- CNAC team

These are the individuals from USAID and two partner organizations who attended the January workshop to work out many of the underlying principles of the WebOPS design philosophy. The workshop was held at CNAC's corporate headquarters in Alexandria, Virginia.

Hold That Knee Jerk!

It is easy to view WebOPS as

- Pie in the sky
- Very high tech
- Very futuristic
- Very expensive
- Very not USAID

As a preemptive caveat, let us note that it's easy to receive a vision briefing like this and then walk out the door thinking to yourself that, while all this high-tech stuff is certainly intriguing, "*it doesn't have much to do with my USAID!*" We've listed a few of the "gut reactions" we've encountered with some USAID personnel and partners, and none of them are very unique to USAID (just substitute any large organization in the last sub-bullet). In fact, many large firms have responded in this manner to *most* of the advances in Information Technology (IT) in recent years. Remember when the Internet was just a fad with no business potential? It wasn't that long ago.

Believe us, we know that USAID's recent experience with IT (i.e., the NMS) has been hard on staff morale. We also know that there's more than a little cultural resistance across USAID to employing Internet technology in as open a manner as we'll describe here. But there is one inescapable truth that USAID can't ignore—many of your partners are moving ahead with these tools in a serious way. USAID doesn't want to play the role of "IT handicap" in this crowd. Delivering information—and dealing with it—is USAID's business.

Some Responses

- Internet is ultimately cheapest avenue
- WebOPS is a technology within USAID's reach now
- WebOPS technology will soon be ubiquitous in U S
- The spread of Internet and dropping PC prices will do the same for much of Africa over next 3-4 years
- USAID needs to build to downstream technical realities—building to today = NMS experience
- Bottom line you want to lead, not follow, so getting your feet wet now makes sense

But rather than wax poetic about the stunning pace of change in IT, we'll simply offer a few straightforward responses to the concerns we listed. First off, there's a good reason why business firms all over the world are moving as much of their interactions with customers as possible onto the Internet—it's just plain cheaper.

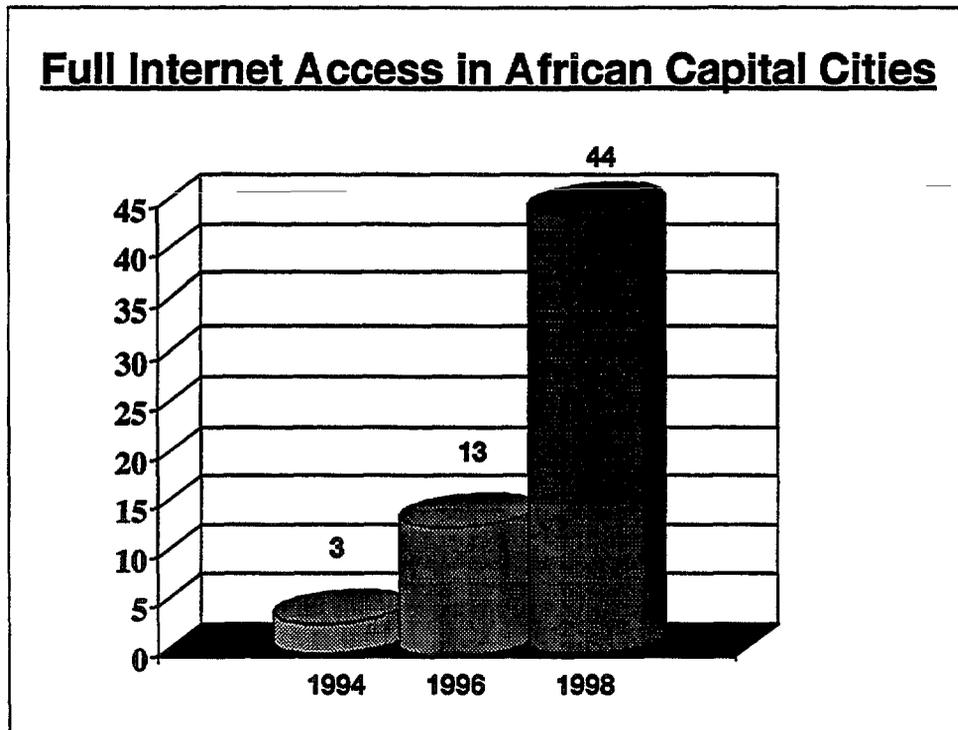
Second, the WebOPS guiding principle is to use Commercial, Off-the-Shelf (COTS) software programs wherever possible. We're not interested in reinventing any wheels. Almost all of what we need for WebOPS is already on the market.

Third, these networking technologies are spreading like wildfire throughout the business world. They will be ubiquitous within the U S in a couple of years and across much of the world within a decade. Most of USAID's partners either are already moving in this direction or will in coming years.

Fourth, the rapid growth of the Internet (e.g., prediction of 1 billion subscribers by 2005) and the continuing decline in computer prices means WebOPS-type IT will be available across much of Africa within five years.

Fifth, USAID needs to plan its IT investments with a downstream mentality, and that means "building to tomorrow." "Building to today" gets you NMS.

The bottom line for USAID? The Agency must become an early adapter of web-based IT or risk becoming irrelevant to many of the world's developing regions that will be experiencing tremendous strides in computing and telecommunications in coming years. That's where the market is heading, and USAID doesn't want to be left behind.



According to a January 1998 article posted by Mike Jensen at the SANGONET (Southern Africa's Nonprofit Internet Service Provider) web site (<http://demurge.wn.apc.org/80/africa/>), "currently over three-quarters of the capital cities in African countries have developed some form of Internet access—either a local dial-up store and forward E-mail service with a gateway to the Internet, or a full leased line service" And 44 of those 47 countries enjoy Internet access in their capital cities—a 13-fold increase from 1994. Most of these countries have more than one Internet Service Provider (ISP), with South Africa featuring by far the most mature market overall (accounting for about three-quarters of all subscribers on the continent)

Five more countries currently plan to join the club, leaving only five with no near-term goals (Comores, Congo-Brazza, Eritrea, Libya, and Somalia)

As Jensen states "A recent development of note has been the rapidity with which African public telecom operators (PTOs) have started to establish Internet services. This follows trends in the developed countries where almost all of the major PTOs have established Internet services." Twenty-seven countries have seen their PTOs establish Internet services to date, and even more impressively, "The larger multinational Internet providers (AfricaOnline/Prodigy, CompuServe, Eunet, UUNET and Global One) are also now beginning to move into African countries and are expected to gain a significant share of the market." What's this all mean? It means WebOPS is swimming with the tide

NOTE: Data for 1994 and 1996 come from User's Guide to Electronic Networks in Africa (<http://www.aaas.org/international/africa-guide/userrgdl.htm>)

Caution--Paradigm Shift Ahead!

- USAID needs to expand its IT vision

**beyond the O&E
funding paradigm**

**beyond the
intranet paradigm**

**beyond the Internal
accounting paradigm**

**beyond the intra-agency
communications paradigm**

In wrapping up our opening comments, you'll have to forgive our use of an oft-quoted phrase—paradigm shift. But it really fits the bill

Like most large organizations, USAID has tended—until very recently—to view IT advances from a fairly confining perspective (e g , internally-focused rather than externally-focused, O&E-funded as opposed to program-funded) Not surprisingly, this somewhat narrow vision leaves USAID mostly talking to itself, in terms of intra-agency communications

There's nothing wrong with that per se, because every global organization uses the Internet first and foremost as an inexpensive means of communication It's just that the reengineered USAID, with its new OPS system, aspires to so much more in terms of strengthened communication and collaboration with partners and customers Problem is, USAID's narrow IT vision has resulted in most of its assets being trapped within its global intranet, inaccessible to partners and customers because they're outside the firewall The classic example of this is the OPS module of the NMS designed for Strategic Objective Teams' use, few, if any, partner organizations have ever laid eyes on it because the NMS sits behind the USAID firewall So in effect, what you have is the main online tool for collaborative management between USAID operating units and their partners being off-limits to the partners themselves! Sound bad? It is, but it's only one example of how USAID needs to think far more broadly about how the rise of the Internet will alter the way in which it does business around the world After all, isn't USAID in the information-delivery business?



Having dispensed with our project management information and opening remarks, we now begin the main body of the briefing

The Road Ahead

- Where WebOPS fits in our big picture
- WebOPS and the NMS/successor?
- OPS-Lite is dead! Long live WebOPS!
- The WebOPS vision
- Design requirements
- The Phase I WebOPS web site mock-up
- Our plans for Phase II

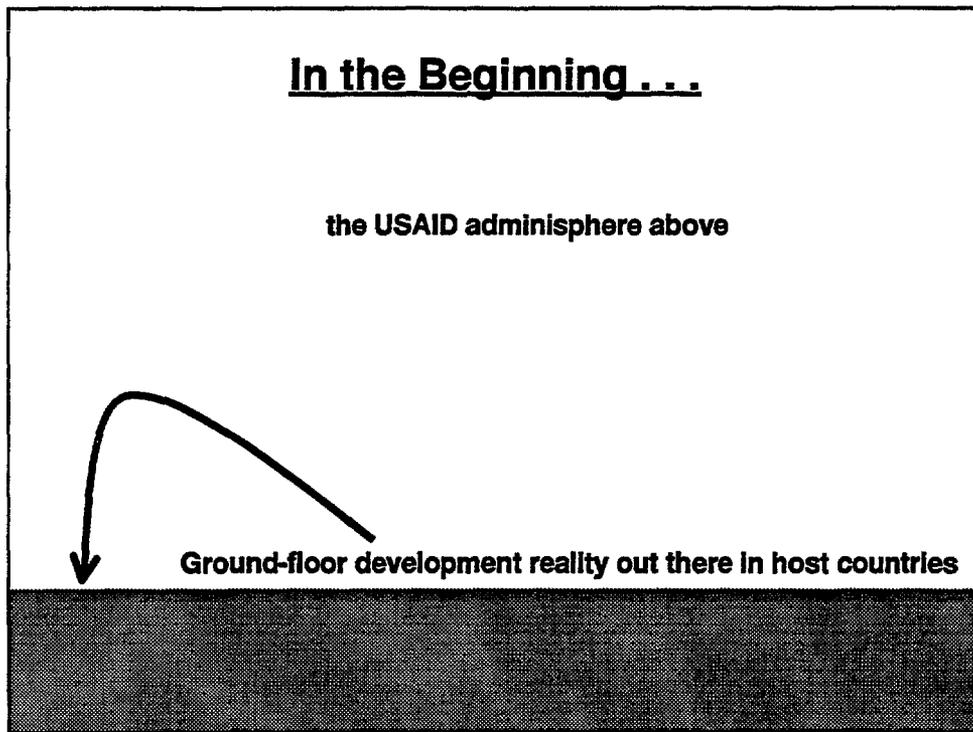
We'll present the WebOPS concept in a chronological fashion, meaning we'll take you through our initial thinking on the subject and show you how it progressed over the course of the Phase I effort. As such, our first section (The Big Picture) frames the WebOPS idea within the larger USAID reengineering and reform efforts of the past five years. Then we'll discuss the relationship between WebOPS and the much maligned New Management System (NMS).

The third section takes you through the consensus we achieved at our workshop with USAID personnel in January concerning the WebOPS design philosophy.

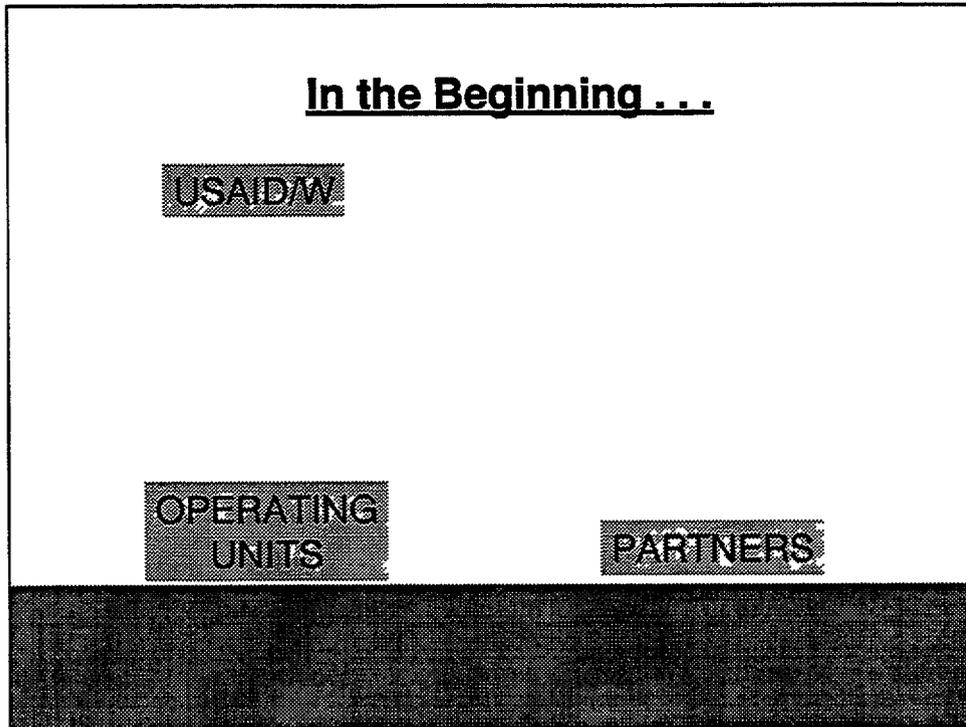
After that lengthy historical preamble, we'll present the WebOPS vision in greater detail, followed by a section listing the essential design requirements.

The penultimate section walks you through our web site mock-up.

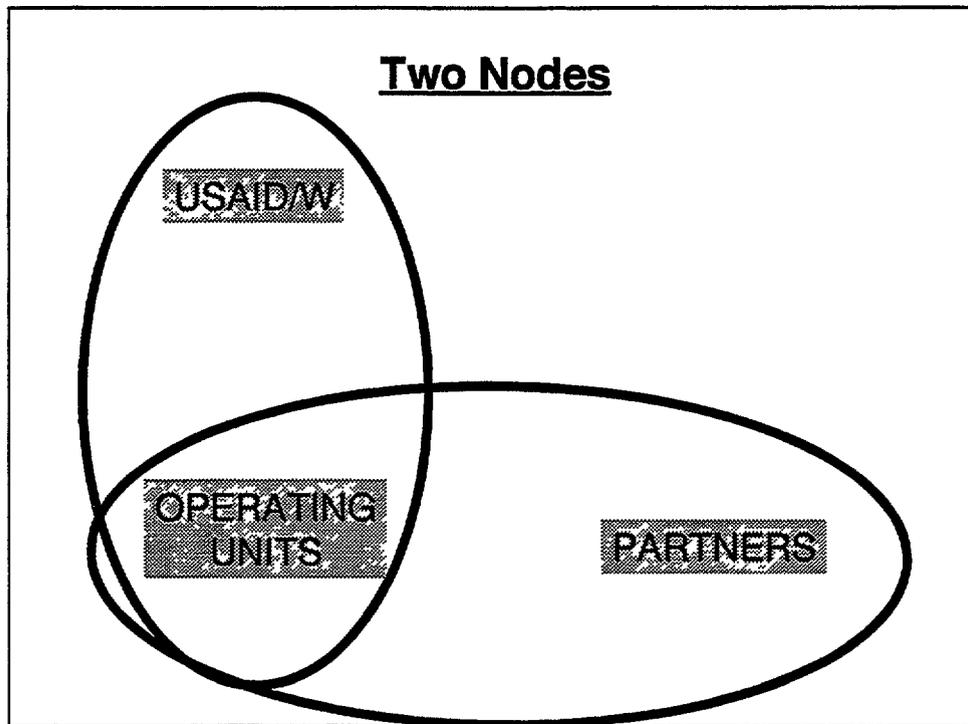
We'll end with a short section that previews the software development phase of the WebOPS effort.



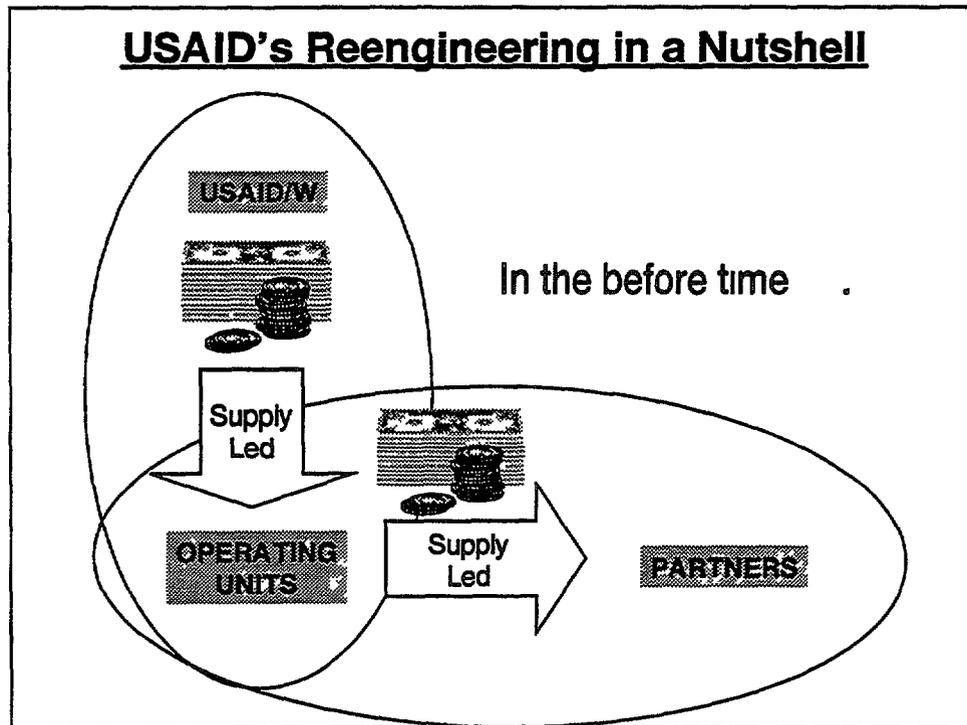
We start our big-picture tale with a very simple concept. that for all the *Sturm und Drang* of USAID Washington's bureaucratic politics, what matters most for the Agency's strategic planning environment is what's really happening out there in the host countries themselves. Differentiating between a ground-floor reality and the "adminisphere" above is not just another expression of the tension between headquarters and field, or between policy-makers and operators. Rather, we draw the line to illuminate the two major organizational relationships that define USAID as a federal agency: one internally focused and one externally focused.



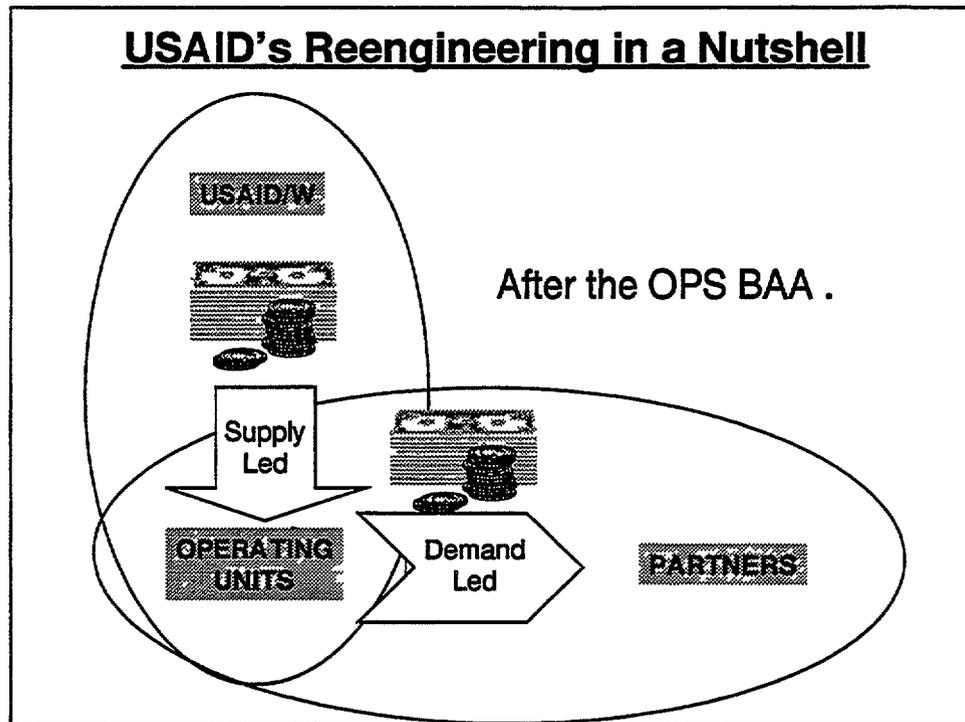
Three essential players define USAID's organizational culture: USAID/Washington (USAID/W), the operating units, and the partners. While knowing that it's not always the case that operating units are located in host countries, for simplicity's sake, we place both them and the partners down on our "ground-floor reality," for the activities of those two players basically define USAID's operational product, or service (i.e., the delivery of information and funding for development activities), whereas USAID/W is fundamentally limited to oversight and support functions.



From these three key players we delineate two fundamental relationships. The first we'll describe as the "vertical node" linking USAID/W and the operating units. This management relationship is basically defined by the annual budgetary allocation process, with its preceding evaluation procedures. The second we'll describe as the "horizontal node" linking the operating units and the development partner organizations. This operational relationship is defined by the key components of the new OPS system, namely the Results Framework (RF) and teams assigned to each Strategic Objective (SOT) and Results Package (RPT).

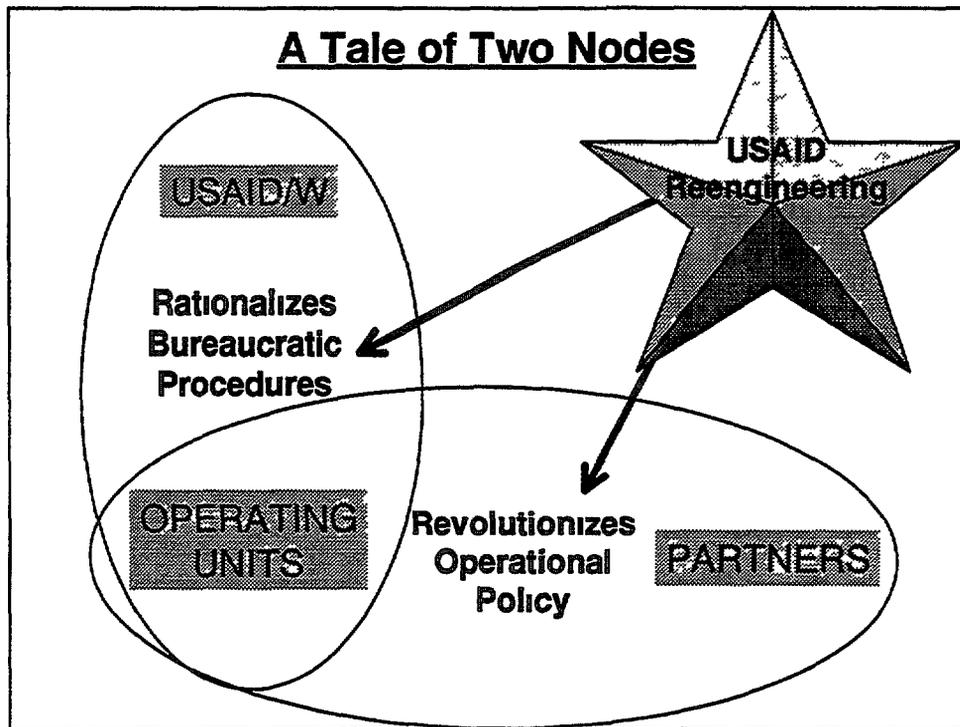


Prior to the new OPS system, USAID's budgetary allocation process was supply-led from top to bottom. In other words, it was centrally planned and allocated by virtue of supply rather than demand. USAID/W got its pot of money and then allocated according to its own priorities, along with those of Congress and the Executive Branch in general. The money didn't go so much where it needed to go (i.e., the least developed countries), but where the U.S. Government wanted it to go. No big surprise here, for USAID was created in the midst of the Cold War with the Soviet Union. As such, it was but one among many foreign policy institutions that had much of their strategic agendas dictated by our competition with the Soviets for allies in the so-called Third World.

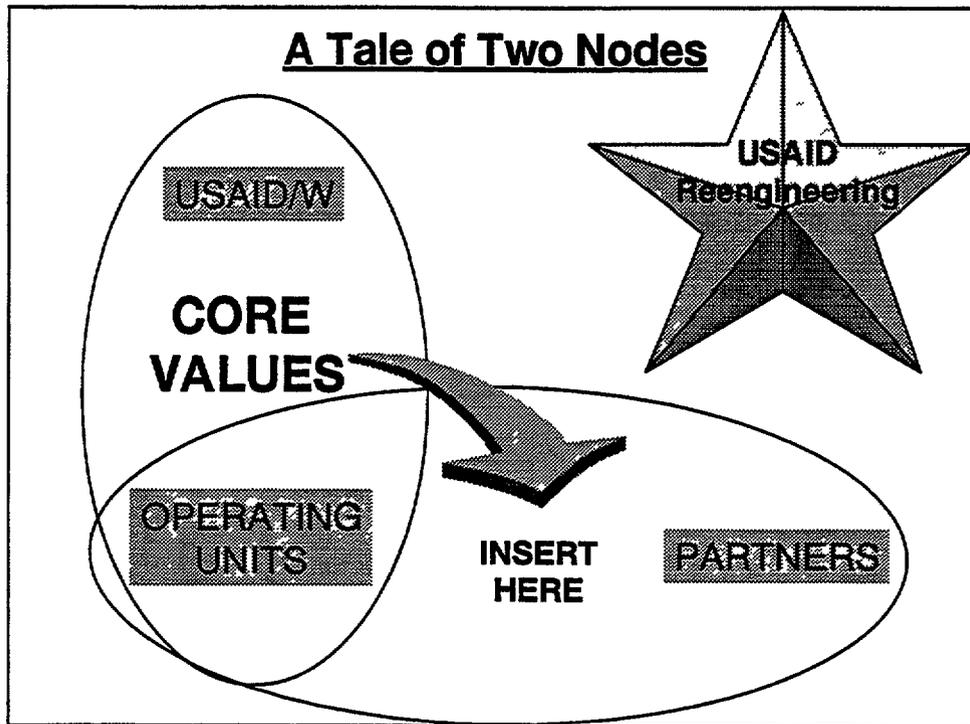


Following the 1993-1994 business-process reengineering effort across the entirety of USAID (i.e., the Business Area Analysis (BAA) teams), the Agency proceeded to test and then implement more broadly an operational philosophy in the horizontal node far different from that of the past. First defined in the Operations (OPS) BAA summary report (*Making a Difference for Development*), this radically new operational approach sought to change the allocation of money “below” the level of the operating units—or more accurately, at the level of the Strategic Objective—from being supply-led to demand-led. In the ideal articulated by the OPS BAA, once agreement was reached between the operating unit and USAID/W regarding any Strategic Objective, the SOT would be able to reallocate funds according to how events unfolded in country over time. Like a mutual fund manager, the SOT would regularly rebalance its “portfolio” to reflect the changing “development market” of the host country.

Naturally, this meant a far greater focus on adaptive management planning, which corresponded to the Core Value of Empowerment, i.e., mission personnel would be empowered to engage in such adaptive planning without necessary recourse to USAID/W. However, because the budgetary allocation process remained supply driven between USAID/W and operating units (as it always will for political reasons), a certain bureaucratic tension ensued: what if Washington’s priorities, as reflected in funding by Strategic Objective, didn’t match up with the ground-floor reality as development activities unfolded? In essence, the question for many operating units became, “Is the emphasis on ‘*managing for results*’?” (meaning greater encouragement of risk taking) or “Is the emphasis on ‘*managing for results*’?” (meaning show progress or lose your funding)

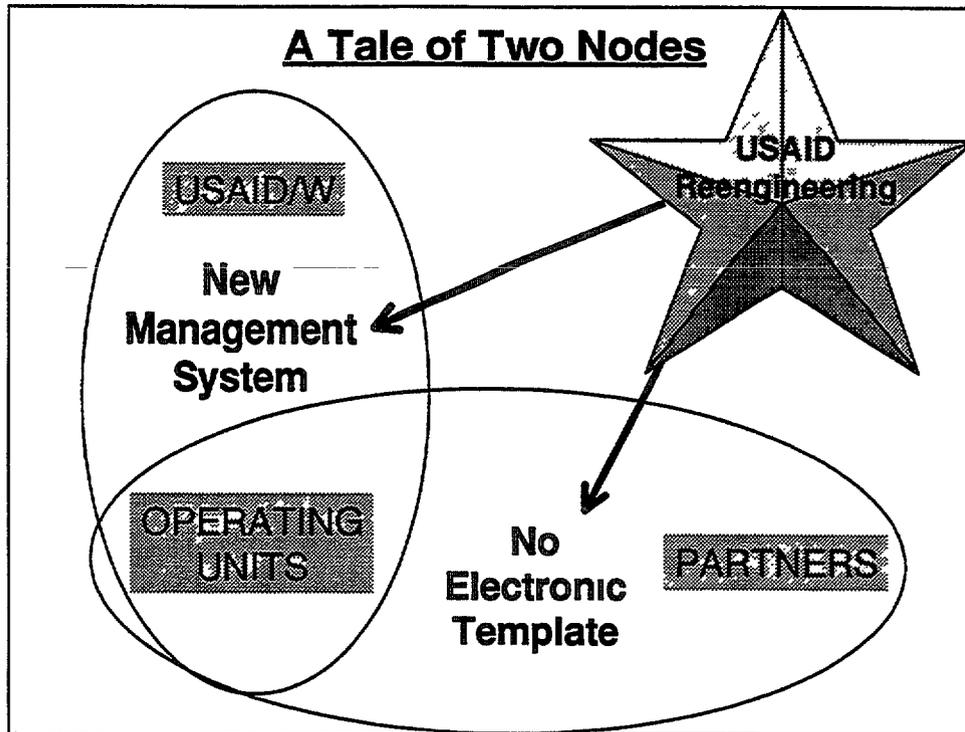


Another way of expressing the bureaucratic tension between USAID/W and operating units is to note that USAID's reengineering effort meant very different things for the two core relationship nodes. In effect, the reengineering effort, known as Results-Oriented Operations Reengineering (ROR), sought to rationalize bureaucratic procedures within the management node to free up operating unit personnel to pursue a revolutionary new operational philosophy in their interactions with partners. By simplifying procedures within the management node, it was hoped that operating unit personnel would be empowered to interact far more *broadly* (Core Value of Teamwork, or participation) and far more *deeply* (Core Value of Customer Focus), which implied far more reliance on partners, who are—by definition—key intermediaries as implementers of development activities.



To speak more broadly on the subject of the Core Values while all of them found original expression as fundamentally new ways in which USAID was going to operate internally, their real impact was not within the management node, but within the operational node

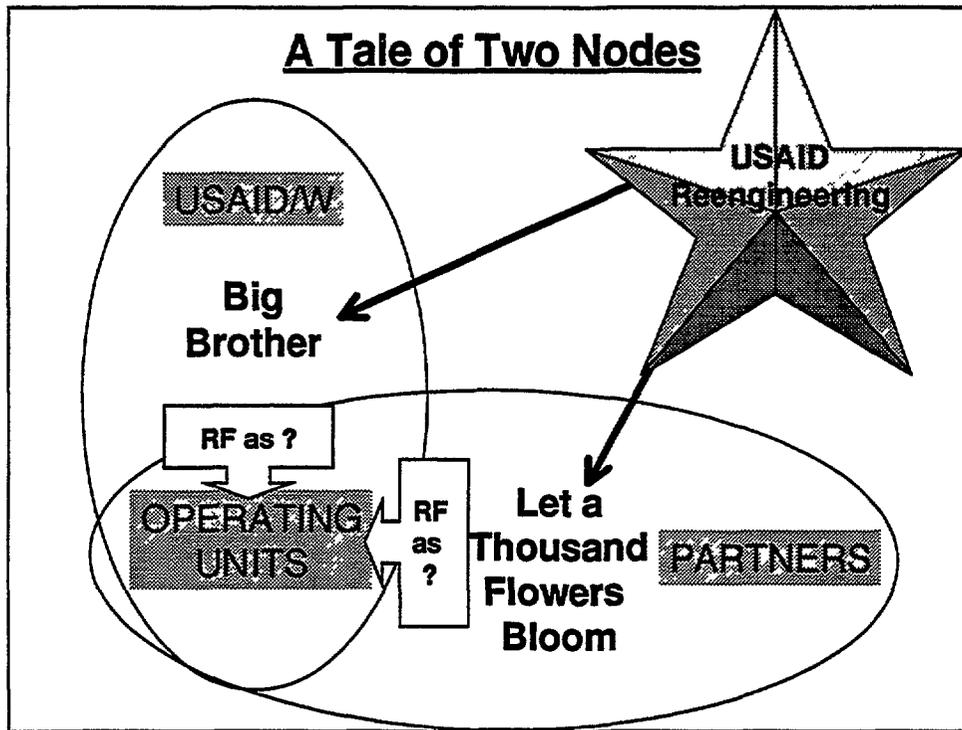
This may seem an obvious point with regard to Customer Focus, but it's far less true with Teamwork, Results, Diversity and Empowerment. Teamwork, for example, has—by and large—*not* lead to greater participation by partners in mission management of Strategic Objectives or Results Packages. In many instances, the so-called Expanded SOT (which was supposed to include partners) is nothing more than what the Core SOT was supposed to be—i.e., made up entirely of USAID personnel. Now we know that some SOTs have made earnest and successful efforts at interacting as Expanded SOTs, but it is true that for the most part, the concept of Expanded SOT has been an ideal of rhetoric—not a reality in action.



One reason why much of USAID's reengineering effort has not made it "outside" the Agency is that operating units really weren't given enough tools, training or technical assistance to make it so. Instead, the push for an improved IT remained almost wholly within the confines of the USAID/W-missions management node (e.g., the New Management System). Why so? The system centered around the input and processing of fiduciary information, meaning it had to be kept private from contractors. This was the essential—and quite reasonable—rationale for keeping the NMS behind USAID's intranet firewall.

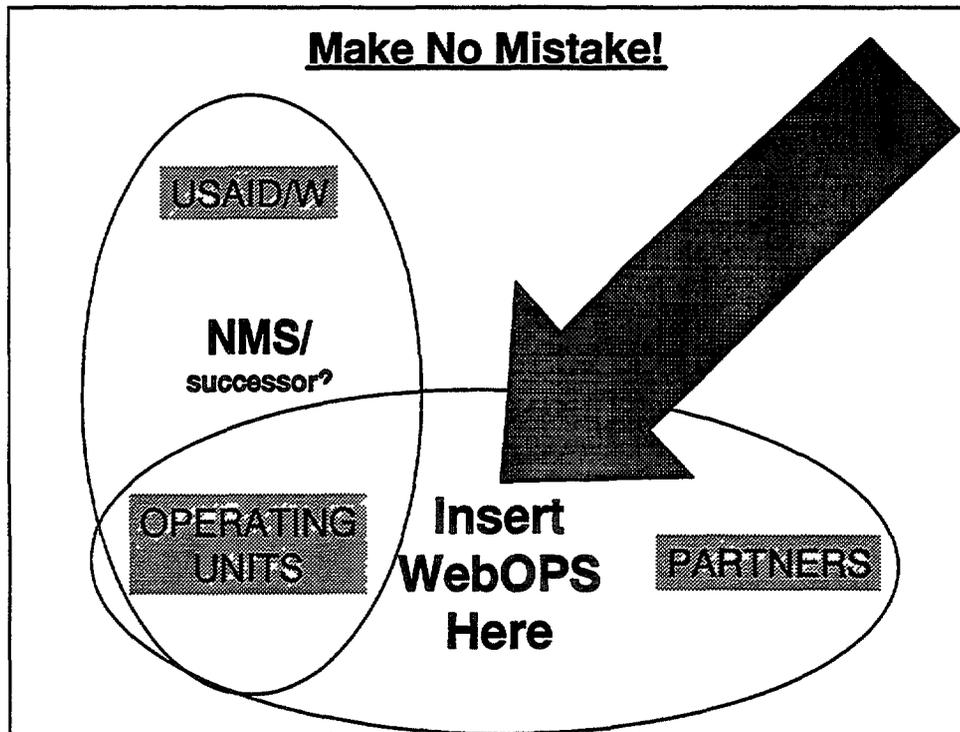
The big problem with this approach, of course, was that NMS lumped the OPS module (where operating units are to build and revise Results Frameworks over time) in with a trio of databases (AWACS, A&A, Budget) that included proprietary information. That meant partners were given no access to the very tools that were supposed to define and facilitate their new and expanded participation in USAID planning, achieving, and judging activities.

Meanwhile, no electronic templates were created or distributed to operating units—much less partners—concerning RFs and Results Packages (RPs). USAID had reengineered its relationship with partners to facilitate the achievement of a "shared vision" in the development hypotheses encapsulated within the RF. So yes, partners were invited to "share the vision," they just weren't always invited to help build it, and more often than not they didn't have the software to even "look at it." Add in the lack of partner training, and this "reengineered" relationship doesn't live up to its billing.

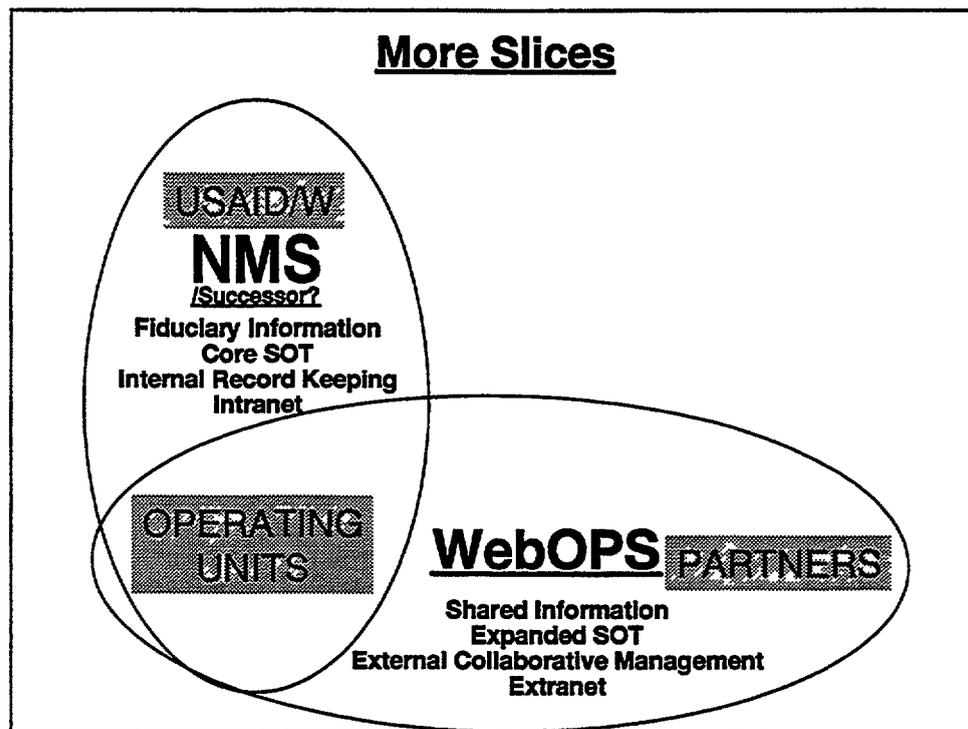


With the NMS looming large in the management node and no electronic template surfacing in the operational node, operating units were caught in the middle between two very different situations. On the one hand, the NMS gave off the feeling of Big Brother, a sort of be-everywhere, see-everything global set of databases that were number-friendly and narrative-poor. In the management node, for example, the RF tends to be considered as a far more practical and numerically-oriented planning methodology, i.e., showing how the money is spent by activity. It's not about showing all sorts of hypotheses to test, nor "guesstimating" the impact of other donors that USAID can't control. It's about getting USAID/W to sign off on your budget for another year. In short, operating units are incentivized to tell USAID/W as little as possible.

Meanwhile, in the operational node, a very different sort of laissez-faire attitude emerged. Since they were no accepted templates for RFs, the philosophy was one of Let a Thousand Flowers Bloom. A few "flowers" have blossomed in various operating units, but so have a lot of "weeds," judging by the lack of consensus existing across the Agency as to what an RF really is. Reading the RFNet message traffic is illuminating in this regard, for every so often a debate erupts over what an RF should really attempt to be, especially in terms of what it should include. Meanwhile, most RFs end up looking quite similar to the old Objective Trees (i.e., file cabinet labels arranged in those familiar, vertically-arrayed chains of boxes), suggesting that the original vision of the OPS-BAA of the RF as a sort of causality-relationship "map" got lost in bureaucratic translation.

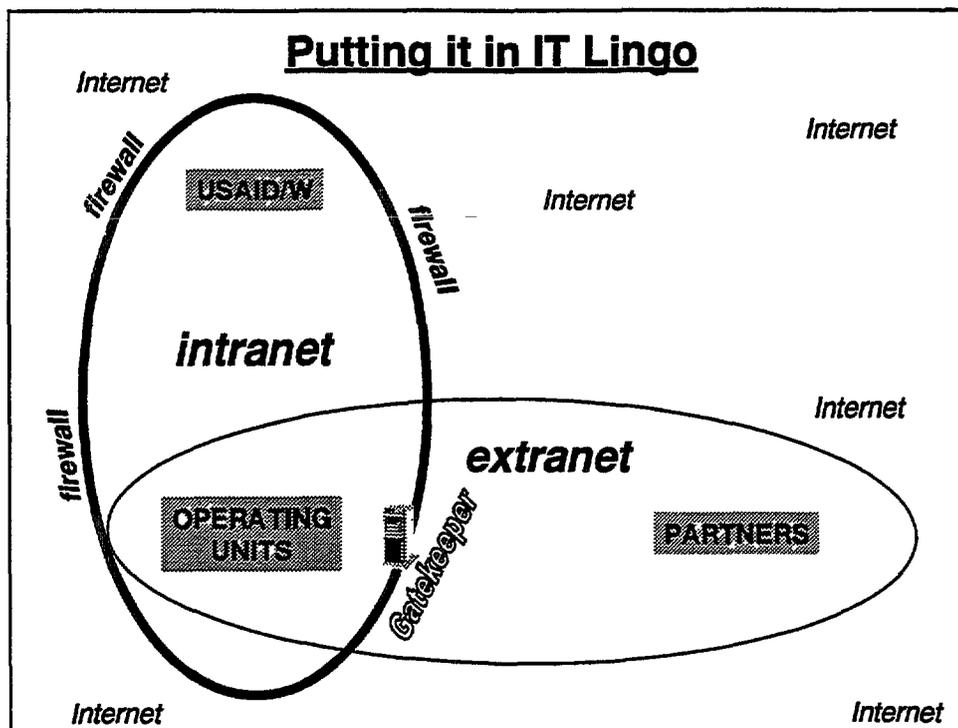


This discussion of USAID’s reengineering history is relevant to the WebOPS concept in the sense that it places WebOPS firmly in the operational node between operating units and development partners, as opposed to the management node defined by NMS or its eventual successor—however named. WebOPS seeks to fill an “information gap” between operating units and partners concerning the nature and operation of the new OPS system. By creating an electronic “work space” or “teaming space” for members of Expanded SOTs and RP Teams, WebOPS provides them with IT tools not only to achieve a shared vision in the form of a Results Framework that is a “living document,” but the groupware applications to facilitate the day-to-day management of development activities.



Other ways to differentiate the role WebOPS can play in the operational node, compared to that of NMS in the management node, include the following

- NMS involves fiduciary information, whereas WebOPS would be restricted to planning and management information that can be shared with partners
- NMS's subject matter comes under the purview of the Core SOT, whereas WebOPS is designed to facilitate the day-to-day functioning of the Expanded SOT by overcoming some of the communication difficulties that sometimes make the inclusion of partners in Expanded SOTs a rather difficult affair, logistically speaking
- NMS's focus is on internal record keeping, whereas WebOPS' focus would be on externalized collaborative management "outside the building" of the operating unit.
- NMS is a creature of USAID's global intranet, and hence is hidden from partner view behind a firewall, whereas WebOPS involves creating an "extranet" access to some small portion of USAID's intranet for partners located outside the firewall



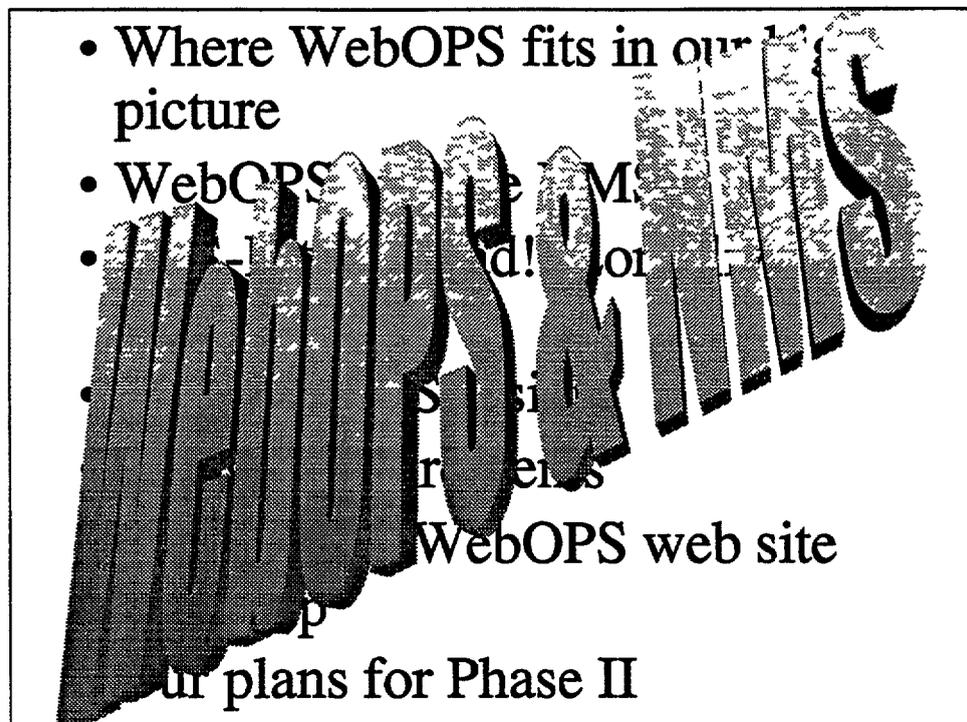
In essence, our two-nodes graphic also serves to delmeate a crude IT architecture between USAID proper (USAID/W and operating units) and the world outside (to include the partners)

First, think of the entire white space of the slide (outside the nodes) as the Internet, in all its hypertext and hot-link glory

Then think of the vertical node as USAID's global intranet, or—in IT lingo—a “virtual private internet.” USAID's intranet, fenced off from the Internet-at-large by a secure firewall, is accessible from without only through specific gatekeepers that require passwords for dial-up entry

When an intranet, such as USAID's, allows some group of outside users to gain regular access to some portion of its intranet, this is described as an “extranet.”

WebOPS, therefore, represents a vision for placing as much of USAID's IT architecture outside the firewall as possible—to “open up” USAID's IT paradigm to make it more inclusive of partners and, by doing so, realize ROR's Core Values in ways not yet achieved by the existing IT tools of the new OPS system.

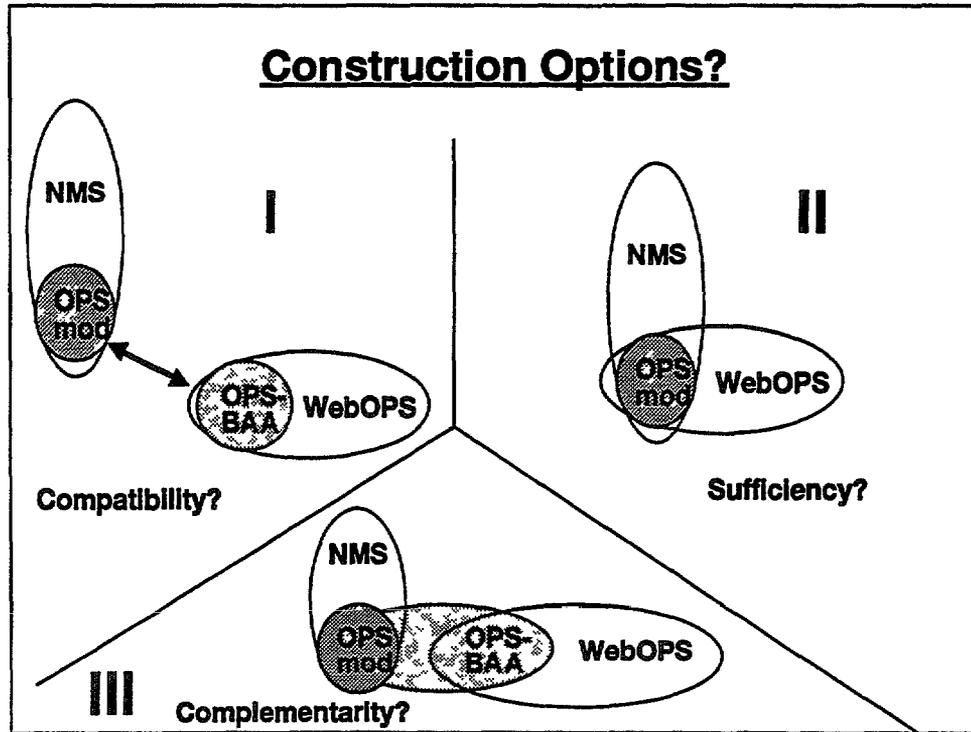


In this section, we explain our thinking of how WebOPS should interact with the New Management System, or NMS

Despite the great difficulty encountered in making the NMS operational throughout the Agency, the initial goals of the system were correct, and remain so to this day

- To combine the myriad of financial reporting systems into one universal system
- By doing so, to free up mission personnel to focus more time on managing—in a collaborative fashion with partners—USAID's development activities in the field

WebOPS should not be viewed as a successor or competitor to the NMS, for its design philosophy is entirely different—even antithetical in some key respects (e.g., shared information versus proprietary) In reality, WebOPS seeks to complement the NMS by providing both missions and partners with sufficient software capacity to realize the second of the NMS's goals—more collaboration in planning, achieving, and judging on a day-to-day basis In doing so, WebOPS aspires to fill what many observers believe is an information-gap that exists both between USAID missions and their partners and among the partners themselves

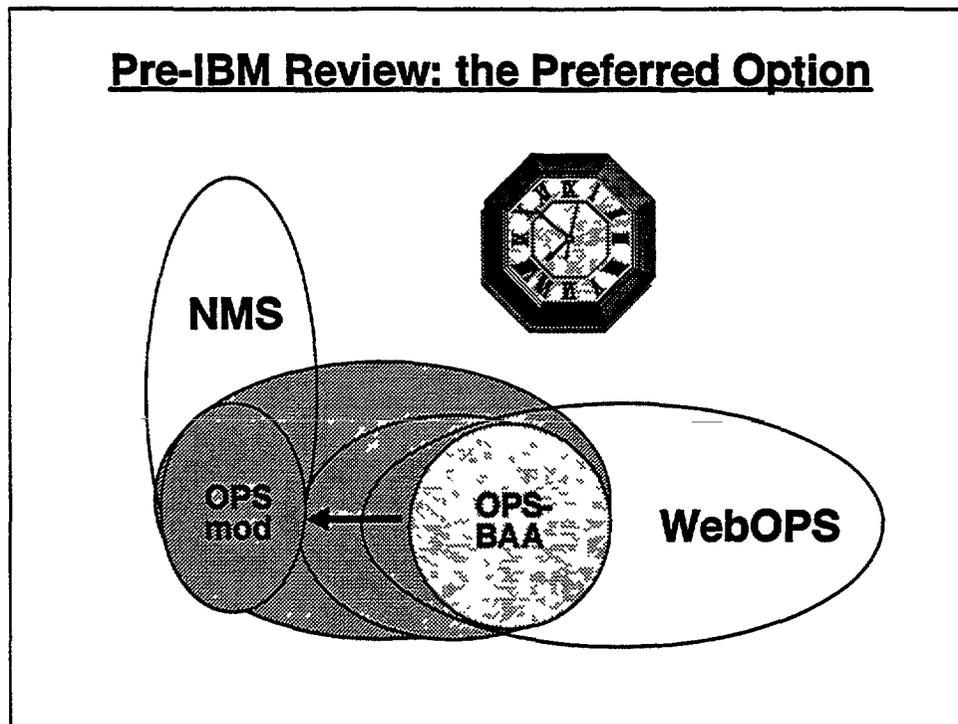


This slide illustrates some of our preliminary thinking concerning the basic construction options available regarding WebOPS and the existing OPS module of the NMS. These construction "blueprints" are based on the "big picture" nodes presented earlier.

In the first option (I) we considered the existing NMS, along with its OPS module, would be completely or substantially different from WebOPS and its focus on realizing the original vision of the OPS-BAA report. The major, and undoubtedly fatal, flaw of this option is the problem of compatibility between "two sets of books," i.e. two program suites that can't "talk" with one another.

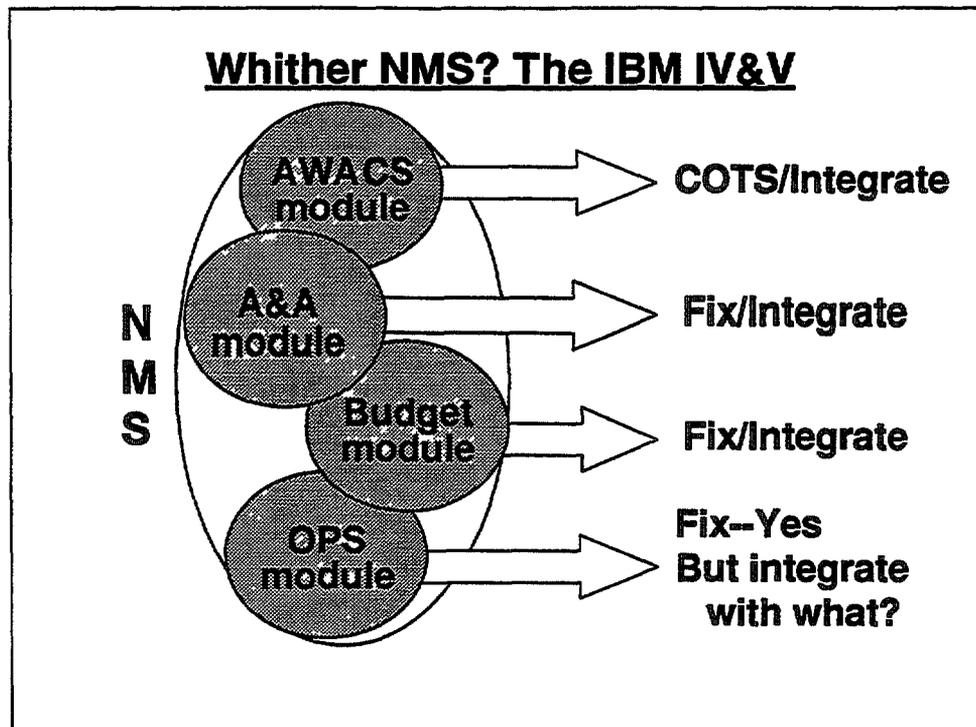
The second option (II) suggests the possibility of transplanting the existing OPS module from the NMS into WebOPS, supplementing it with additional groupware that addresses field management needs not currently met by the NMS. One major problem with this option is information security—i.e., the NMS is built around proprietary data. Other problems include the current incompleteness of the NMS OPS module and the hardware/software burdens placed on development partners. Our basic goal is to keep WebOPS accessible via commercially-available software, such as a web browser like Netscape or Microsoft Internet Explorer.

The third option (III), discussed on the following slide, proposes to address the challenges posed by the other two options.



In this rendition, WebOPS would ultimately be compatible with the NMS, and would complement the existing OPS module by linking it to the OPS-BAA's original vision of day-to-day collaboration between operating units and development partners. In practical terms, this means we borrow certain design aspects of the OPS module to create WebOPS, but that we're not limited to the NMS's current capabilities. The other great advantage of this approach is that WebOPS can be customized and scaled to accommodate technological advances (i.e., it's not tied to a legacy system such as NMS). As such, our approach to the design and ultimate construction of WebOPS is reflective of this third construction option, illustrated on p. 24 and amplified above with time being factored into our deliberations.

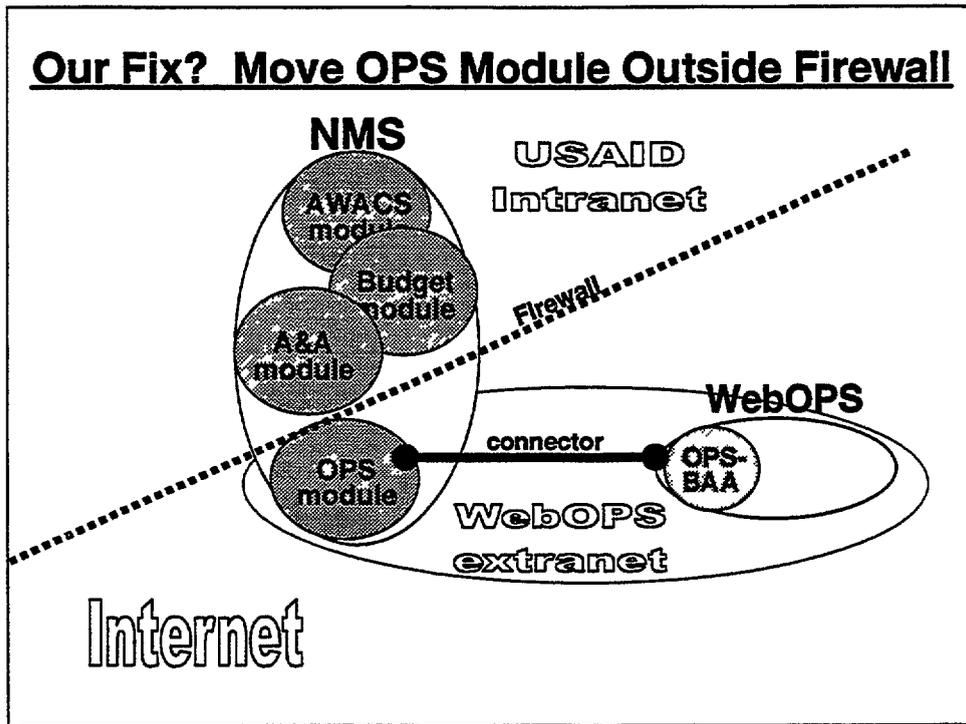
When we originally settled on this option back in January 1998, IBM was still in the midst of its Independent Verification and Validation (IV&V) of NMS, thus our decidedly longer-term approach bought us some time to see what eventually would happen to NMS. After all, it is virtually impossible to build IT connections to a large data architecture which is itself undergoing dramatic change. In short, we decided to concentrate on building our "small and beautiful" WebOPS and assumed we'd be able to marry up with NMS or its successor (i.e., USAID's corporate databases) somewhere down the road—our confidence reflecting only our adherence to web-based solutions and the KISS principle (keep it simple, stupid!)



The IBM IV&V basically flunked three of the four modules of the NMS (AWACS, A&A, Budget), saying a legitimate option would be to replace them all out of hand with something COTS. However, IBM did propose that, if greater efforts were made at integrating the three financial modules, they could all be salvaged through extensive fixes to their software.

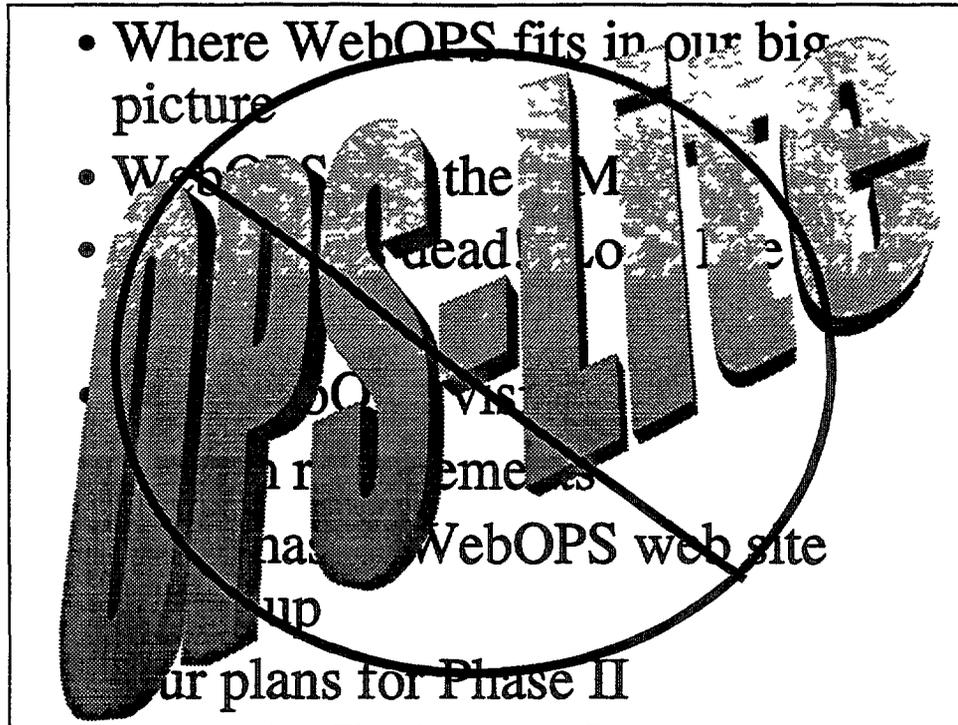
The story on the OPS module was different, though. In a nut shell, IBM was rather favorably impressed with the OPS module—it just didn't see much utility in integrating it with the other three.

But as we stated earlier, we think the disutility of keeping the OPS module within the NMS—and therefore behind the USAID firewall—is based on a whole lot more than the difficult task of integrating the software equivalent of “apples and oranges.” In short, we see no reason for the OPS module to be trapped within the NMS at all, for its fundamental utility comes in the operational relationship between operating units and partners—not between operating units and USAID/W.



For now, our solution remains the one we chose back in January we build our version of the OPS module for WebOPS, borrowing as much of its design philosophy as is reasonable, and later, we build an upload-download connection between the two

But if we had our druthers, we'd see the OPS module of the NMS situated outside of USAID's firewall—in effect becoming a sort of “WebOPS central,” or clearinghouse of information from various WebOPS web sites affiliated with Strategic Objectives all over the Agency In this manner, the OPS module could serve as gatekeeper or funnel for uploads and downloads of information from NMS proper and the various WebOPS web sites Of course, extra security efforts would be required to achieve this situation



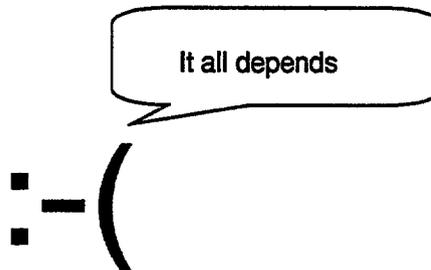
In this section we describe how we jettisoned our original name for this concept (OPS-Lite) and settled on a web-based solution. We thank David McCloud of Africa Bureau's Office of Sustainable Development for pushing us on the name change.

The design analysis presented in this section originated from the study team's intensive, three-day workshop with key USAID Africa Bureau personnel in January, 1998. As such, it serves as a sort of analytical "diary" of the discussions held.

The question:

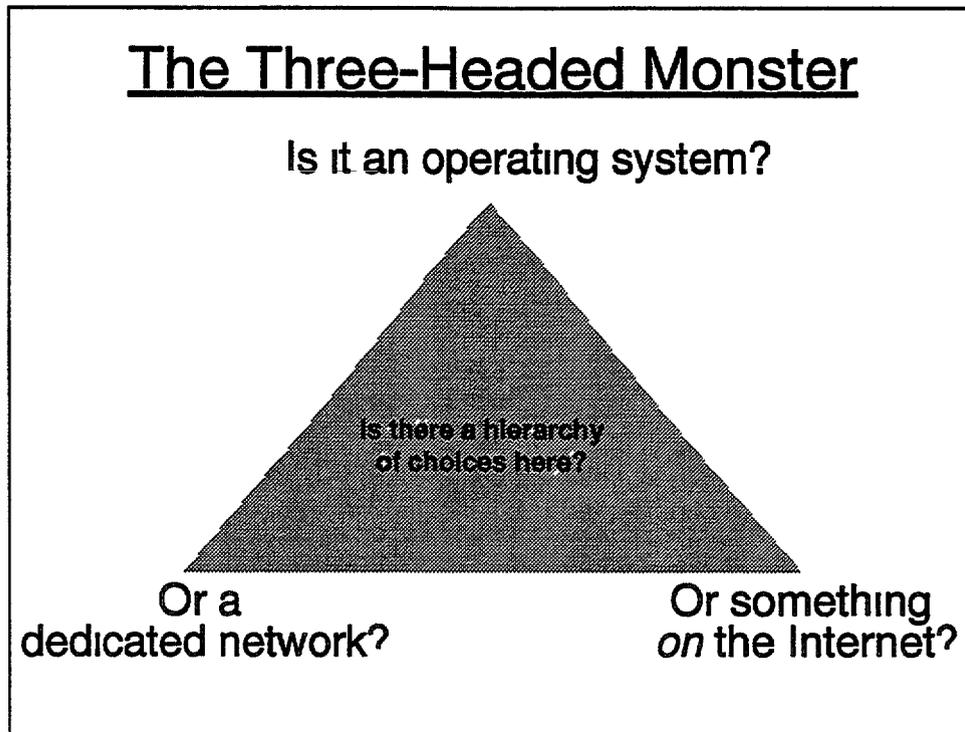
What happens when you turn your computer on?

The answer:



During our January workshop, the study team found itself caught between three competing visions as to what WebOPS should ultimately be. At first glance, these three perspectives and the fundamental challenge each posed seemed so intertwined as to constitute a three-sided mathematical equation. In short, we couldn't "solve" any one side of the "equation" without simultaneously "answering" the other two—hence the informal designation of our quandary as "the three-headed monster" (see next slide)

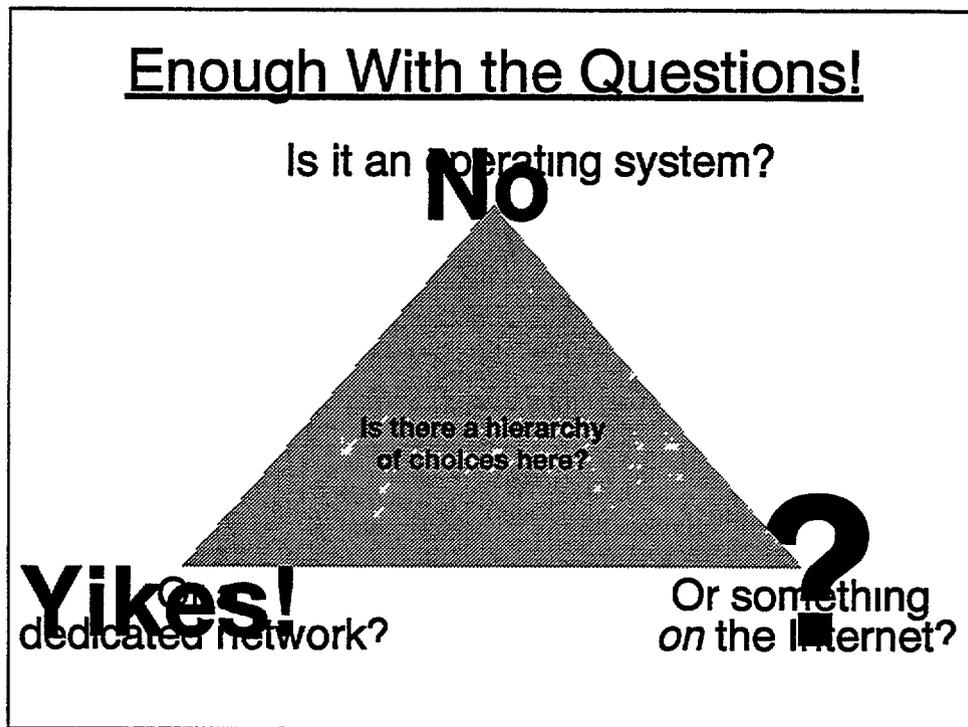
In essence, all of the design issues we faced revolved around these three competing answers to a prosaic question regarding WebOPS fundamental look—namely, "What happens when you turn on your computer in the morning?" As always, the answer depended on one's own expectations



Some of the workshop participants favored the notion of WebOPS being something like an operating system, or a suite of programs resident on individual PCs. Hence the answer was, "You see the WebOPS desktop." In this approach, WebOPS would be integral to each team member's workday.

Others tended to view WebOPS more as a dedicated network that linked PCs together, with the emphasis on collaborative software, such as E-mail and calendar—hence the groupware image. So you would turn on your PC and open up the program whenever you wanted to interact with other team members. The main benefit here would come in facilitating dialogue among team members, a worthy goal that would go a long way to realizing the potential of partners to play a more meaningful role as Expanded SOT members.

A third group thought of WebOPS not as something *in* your PC nor as something that *links* PCs, but rather *somewhere* you'd go *with* your PC—i.e., a web site based on the Internet. The main advantage here is the simplicity of the program involved (web browser) means your PC requirements are smaller, whereas the downside involves Internet connectivity issues.

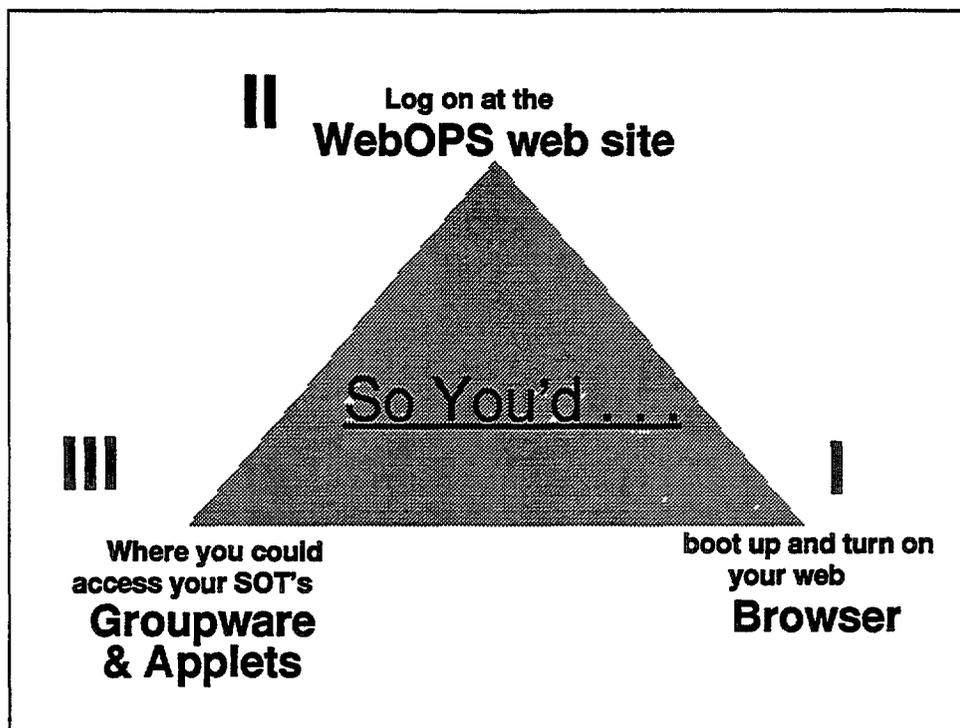


By putting all three perspectives on the same white board and forcing all the workshop participants to confront their inherent interconnectivity, the CNAC study team facilitated a group consensus on which side of the “equation” lent itself to the earliest (i.e., easiest) “solution”

Right away, we knew our answer didn’t start with the desktop image, for the downside here is that every team member—including partners— would face significant minimum system requirements to run WebOPS. Plus, the idea of creating a new operating system goes against the IT trend toward platform independence.

If the operating system paradigm seemed daunting, the dedicated network concept was downright scary. After all, USAID was just “coming up for air” from the NMS situation, why would they ever want to buy into another vision for a legacy system? Especially when everyone’s moving onto the Internet in the equivalent of a global IT stampede? You know, sometimes once is enough.

Moreover, many of the tough questions raised by both the desktop and network visions kept pushing us in the direction of the Internet. For example, where do you store all the SOT data so team members aren’t burdened with trying to keep track of everything, or figuring who’s got the most recent version, or moving lots of files across phone lines all the time? And how do you avoid the obstacle of every team member needing to work off the same software?



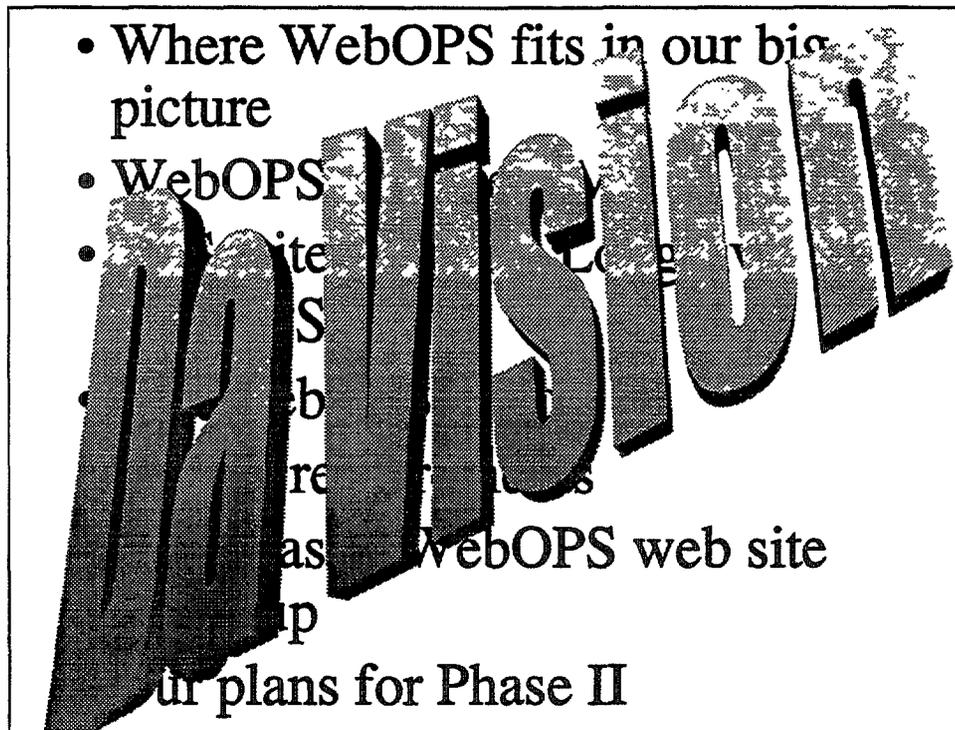
Believing that the Internet's rapid growth will remove many connectivity obstacles in coming months and years, we came to the conclusion that there was indeed a hierarchy of choices that—once discovered—allowed us to tame this “three-headed monster” In the approach we ultimately chose, the answer to the original question is as follows you turn on your PC, open up your web browser, and then log on at the WebOPS web site (i.e., one replicated or “copied” to your Strategic Objective Team), where you could access the necessary groupware suite (i.e., web site “applets”) and shared databases to conduct your daily team management These activities could include entering and processing data, updating text files, conducting electronic correspondence, engaging in chat sessions, etc

So the solution is . . .



This slide portrays what—in effect—became our hierarchy of “solutions ”

What we liked best about this sequence of answers is that it kept our design philosophy mercifully simple. All anyone needs to use WebOPS is a web browser. Once there, the server provides all the groupware needed to conduct collaborative management activities, relieving partners of the burden of keeping up with software developments and therefore keeping WebOPS on the cheapest path possible.



Having tested your patience with all that USAID and IT background, we now come clean on our vision of WebOPS

In sum, WebOPS seeks to play the role of *information intermediary* between USAID missions and development partners, as well as among partners, by providing a Web-based *electronic teaming space* that allows RPT and Expanded SOT members to collaborate—on a day-to-day basis—on planning, achieving, and judging their ongoing development activities. WebOPS takes—as its guiding vision—the methodology for constructing and *operating* a Results Framework (and all its attendant parts, i.e., the Results Packages) that was originally set forth in the OPS-BAA Report of 1994. As such, its main aim is to facilitate dialogue among RPT and Expanded SOT members so as to allow for development hypotheses (i.e., RFs) to emerge as shared team *visions*—subject to periodic testing and updating as mandated by changes in local circumstances and/or development activity outcomes.

WebOPS's success should be measured—first and foremost—in terms of how much it improves the desire and capacity of team members to achieve a shared reality (i.e., the objectives expressed in the Results Framework). In other words, WebOPS should be the *ground zero of ground truth*. To the extent that such a shared vision is created and maintained by team members, WebOPS should serve as focal point for integrating the functions of strategic planning, adaptive management, and monitoring and evaluating progress.

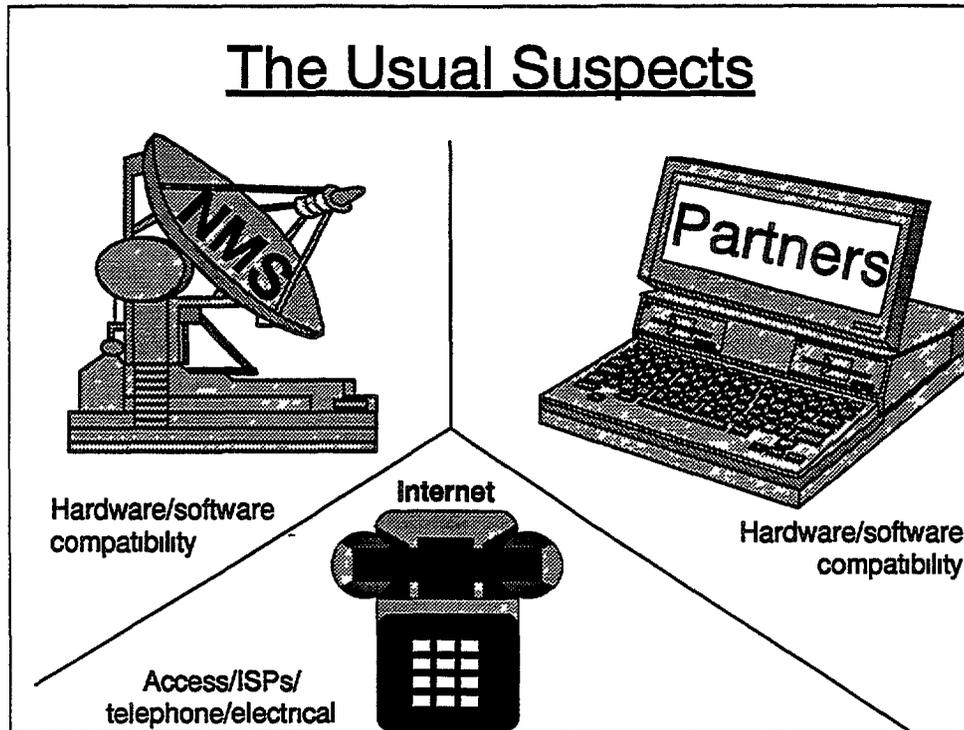
Beyond that key criterion, WebOPS should also be judged by how it contributes to the SOT's efficiency, effectiveness and achievement of results.

Web•OPS \ 'web äps\ n fr OR to weave operations (see *naval*), to improve teamwork within Expanded Strategic Objective Teams by creating a web-based collaborative computer interface between USAID and its partners-- as well as among USAID partners

This slide presents our objective statement for WebOPS

As with all such things, we spent a lot of time getting just the right words, so we'd like to spend a little time explaining our choices

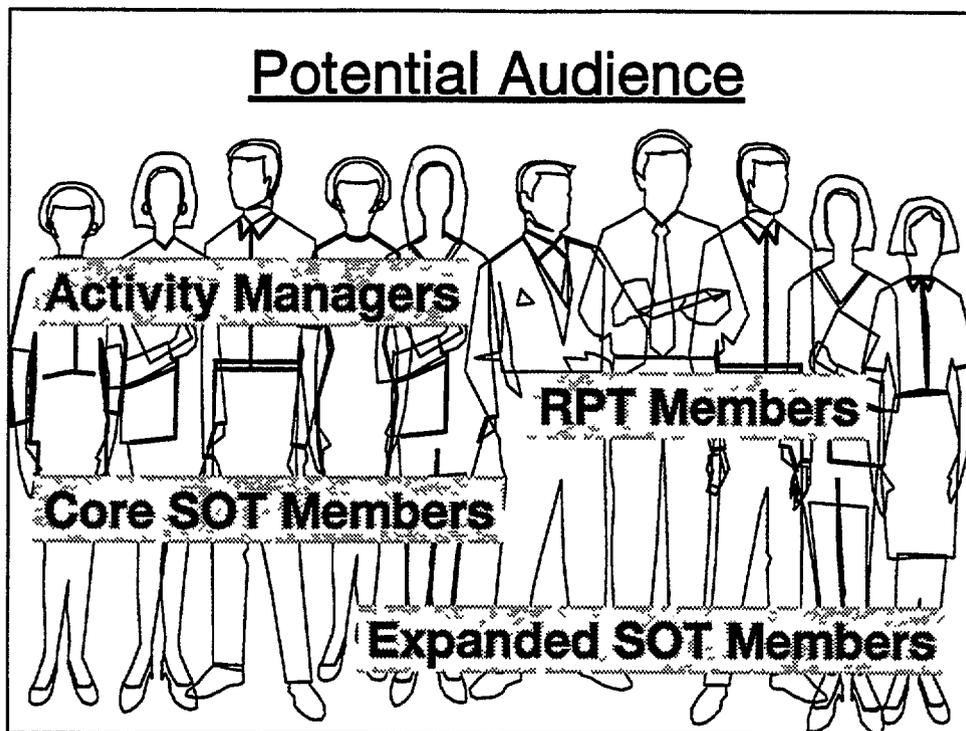
- *To improve teamwork* means we don't pretend that WebOPS will create teamwork where none exists, or that you can't have teamwork without WebOPS. We just think it would facilitate teamwork in an important way by harnessing IT—and the Internet in particular—in a manner consistent with the spirit and vision of the original OPS-BAA report.
- *Within Expanded Strategic Objective Teams* means WebOPS is designed to open up the SOT to partner participation in a far greater way than currently exists in most instances. We're not issuing blame here, nor pointing fingers. We know how hard it can often be to include partners in planning, achieving, and judging—if only in terms of logistics. WebOPS won't make all those problems disappear overnight, but by “virtualizing” participation through the Internet, it may finesse many of them right off the radar screen.
- *Creating a web-based collaborative computer interface* refers to the WebOPS web site we described in the previous section, i.e., using the Internet as an electronic work space between USAID operating units and their partners.
- *As well as among USAID partners* means we believe an important step toward sustainable development is USAID being able to turn its partners loose with the least amount of interference, and a first step toward that is getting them to cooperate with one another as much as possible.



WebOPS's primary task is facilitating dialogue between missions and partners (plus among partners) by enabling real-time, transparent access by users both internal and external to USAID. The equipment, or hardware, may be the same as that needed for the NMS and other USAID operations, but the supporting tools, or software, are different. The main obstacles to realizing the WebOPS vision are therefore the following:

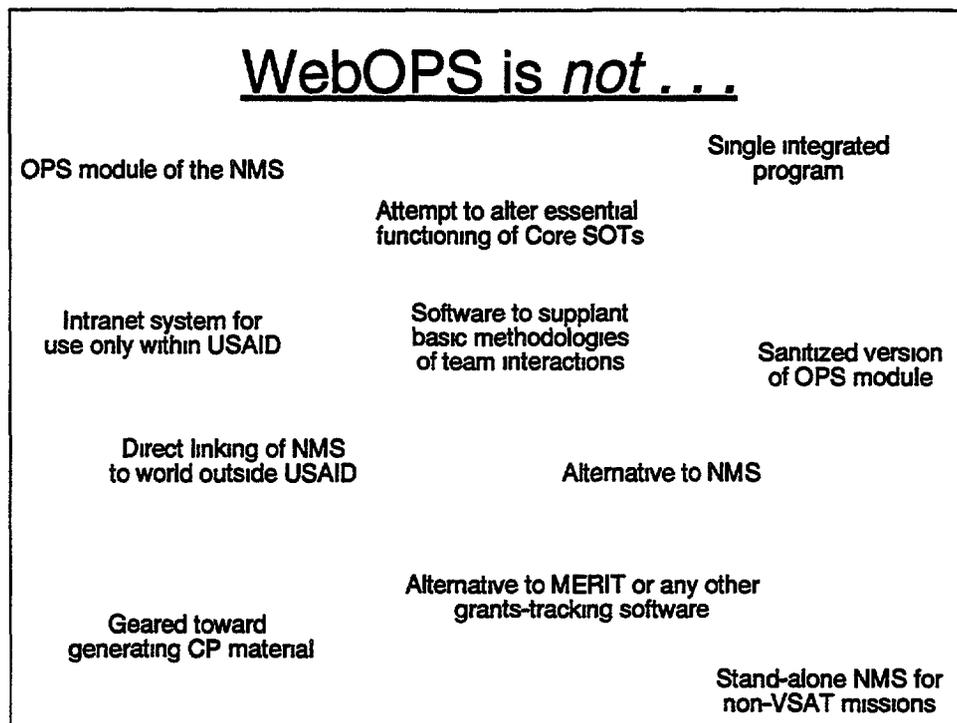
- Hardware and software compatibility with NMS or its successor—keeping all this accessible from individual PCs within USAID missions
- Hardware and software compatibility with partners' assets—driving WebOPS to a web-based environment so as to “dumb down” access requirements to nothing more than a web browser
- Internet access issues—setting up web site servers, designating or even creating local Internet Service Providers (ISP), and the fundamental issues surrounding in-country telephone service (e.g., infrastructure limitations, reliability, cost)

Despite these challenges, we cannot foresee any feasible environment for WebOPS other than the Internet. The world is moving away from mainframe solutions involving legacy systems and toward network solutions featuring simpler terminals accessing ever more capable servers (which, of course, can be located almost anywhere in the world). Understanding these technology trends, we see no alternative to a web-based program suite for achieving the sort of collaborative interactions originally envisioned in the OPS-BAA Report.



Obviously we think WebOPS will have utility for a broad array of USAID personnel, as well as partner personnel. In short, anyone involved in managing or participating in a development activity should find WebOPS useful for their day-to-day work, and—again—when we say “WebOPS,” we mean a copy of the WebOPS web site dedicated to a particular Strategic Objective (and most likely housed on a local ISP).

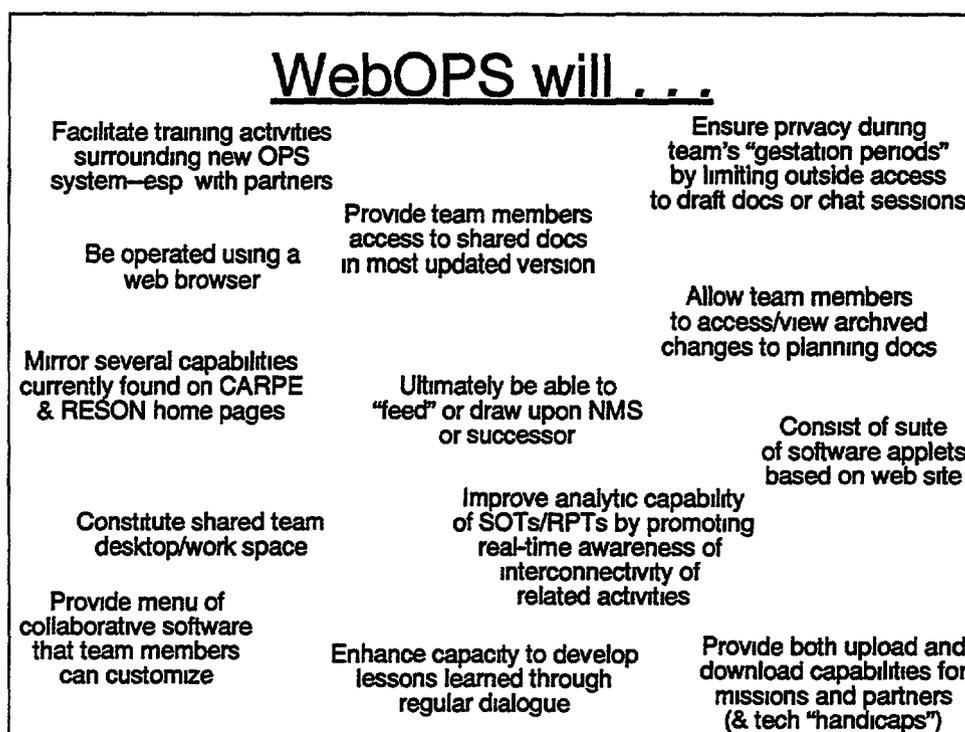
This web site would be part-bulletin board, part-file cabinet, part-electronic meeting space, and so on. In effect, any SO’s WebOPS web site would be a virtual teaming space, complete with storage capacity and communications channels. Not being able to make a meeting wouldn’t be an excuse anymore for not being a full-fledged Expanded SOT member; lacking Internet access would be the main obstacle.



Almost as important as knowing what your IT vision or tool is, is understanding what it is not. On this slide we present a series of statements designed to make that point in spades

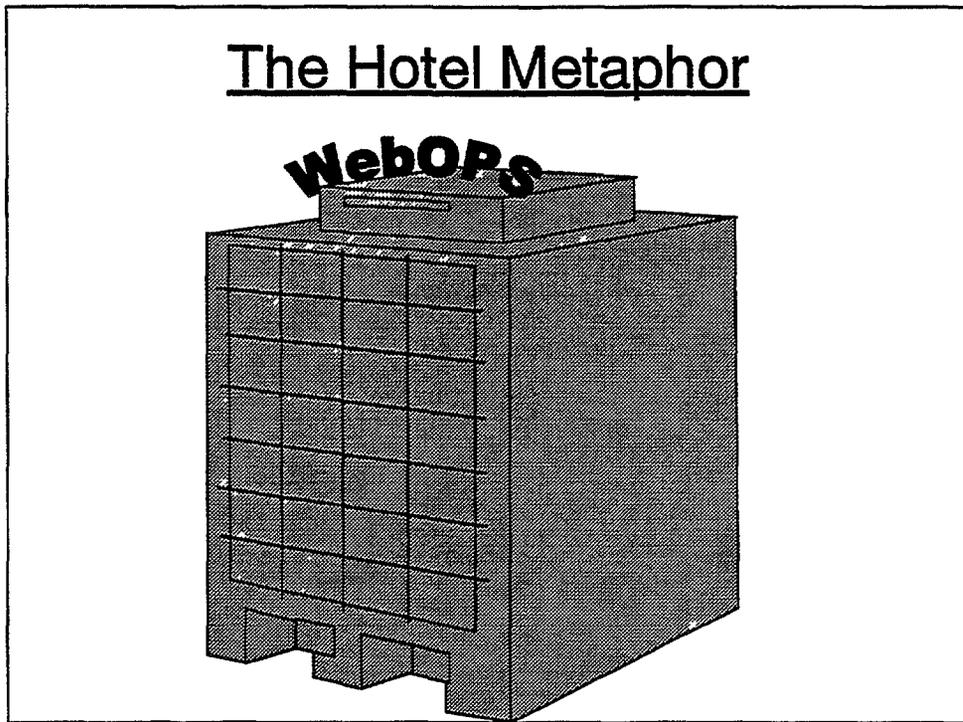
Some of these points (e g , NMS, integrated programs, intranet system, sanitized version of OPS module, alternative to NMS, stand-alone NMS) we made earlier in this presentation, but others require a bit more explanation

- *Attempt to alter Core SOTs* means we're not interested in messing around with fiduciary matters, for which the Core SOT was created
- *Software to supplant team interactions* means "F2F" (face-to-face time) still counts, as does training designed to facilitate team interactions WebOPS is not yet another excuse to short change training
- *Direct linking of NMS to outside world* means we think WebOPS can go a long way to facilitating the collection of information by operating units for submission to NMS, but it is not designed with that purpose in mind WebOPS is first and foremost about improving team interactions
- *Generating Congressional Presentation material* means the same as the last bullet. We think WebOPS will help It's just not its *raison d'être*
- *Alternative to MERIT* means we're not interested in passing up *any* opportunity to incorporate good, WebOPS-like software already being used by operating units (here, South Africa) Again, no reinventing any wheels

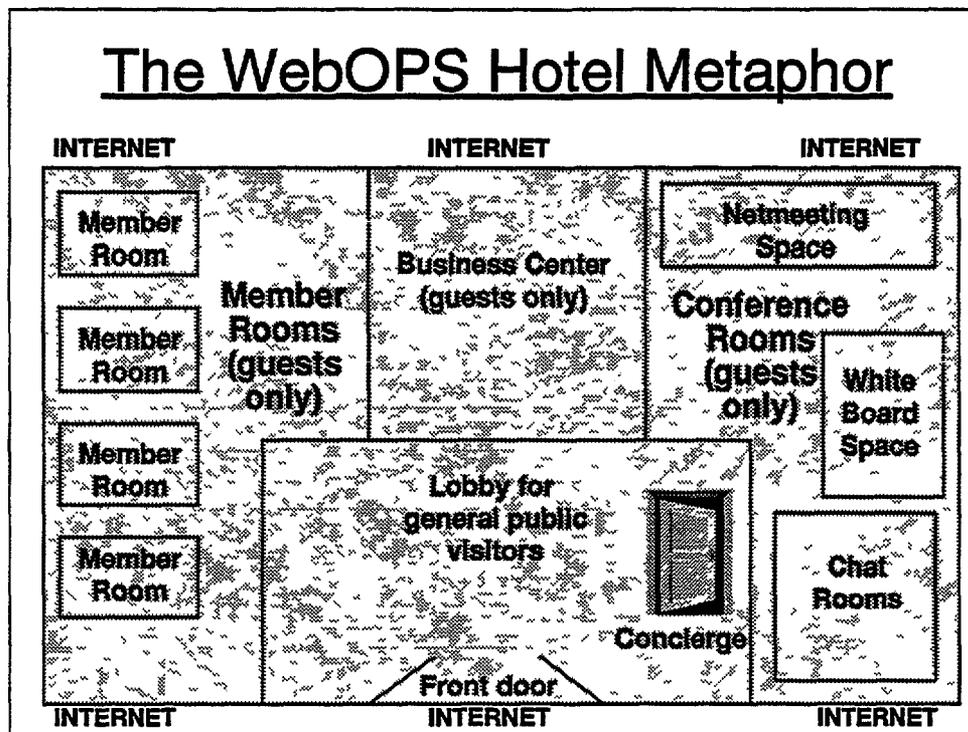


Same drill as last slide, but stressing the positive this time

- *Facilitate training* means WebOPS should provide a unique opportunity for USAID to bring partners on board the new OPS system in a big way by providing an electronic work space in which all this theory becomes real
- *Ensuring privacy during "gestation periods"* means chat rooms and collaborative work spaces accessible only by SOT members via passwords We're not interested in having WebOPS make *everything* transparent—far from it. USAID/W needs to see results, not listen in on every conversation
- *Provide access to docs in most updated version* means all team members are "singing off the same sheet of music "
- *View changes to planning docs* means it's a lot easier to know where you're going when you can see where you've been
- *Mirror CARPE and RESON home pages* means—again—we're not afraid of borrowing from, or copying, anyone Talent imitates, but genius steals
- *Promoting real-time awareness of interconnectivity* means making the sustainable development concept a here-and-now idea. Sustainable development means all sectors of development activities must come together to promote change A first step toward that is promoting real-time awareness of what everyone else is doing
- *Provide for tech "handicaps"* means finding alternative means for connectivity (e.g , CD-ROM) for partners without Internet access
- *Software that members customize* means just that. No "one size fits all."



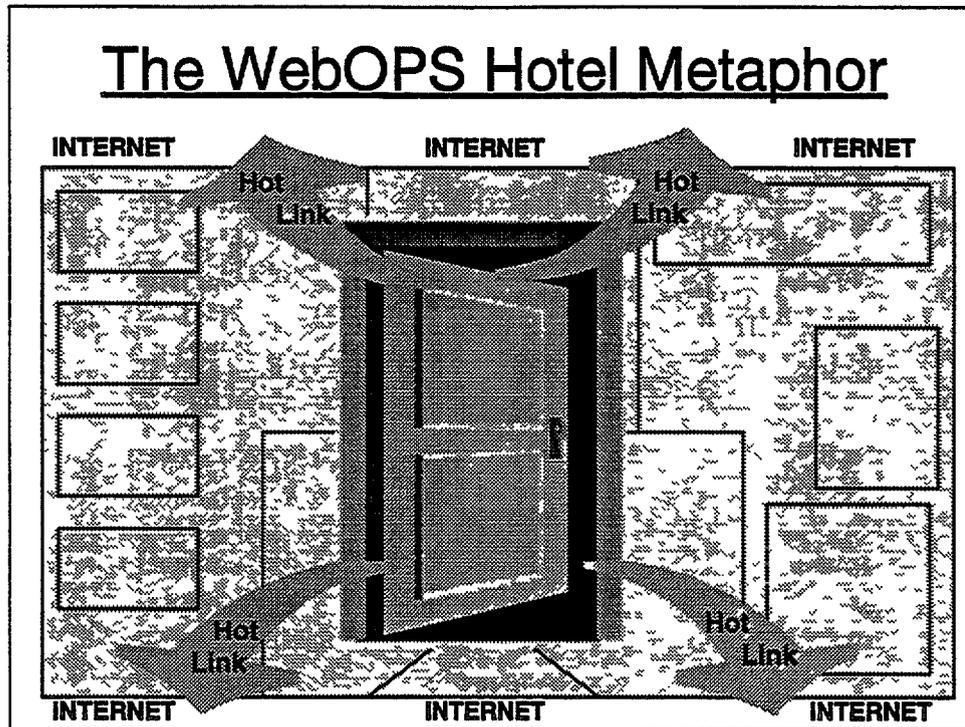
What might this web-based, electronic teaming space look like? While exploring the issue of security, or “who would have access to what,” the CNAC study team, in conjunction with USAID personnel, came up with the metaphor of the hotel



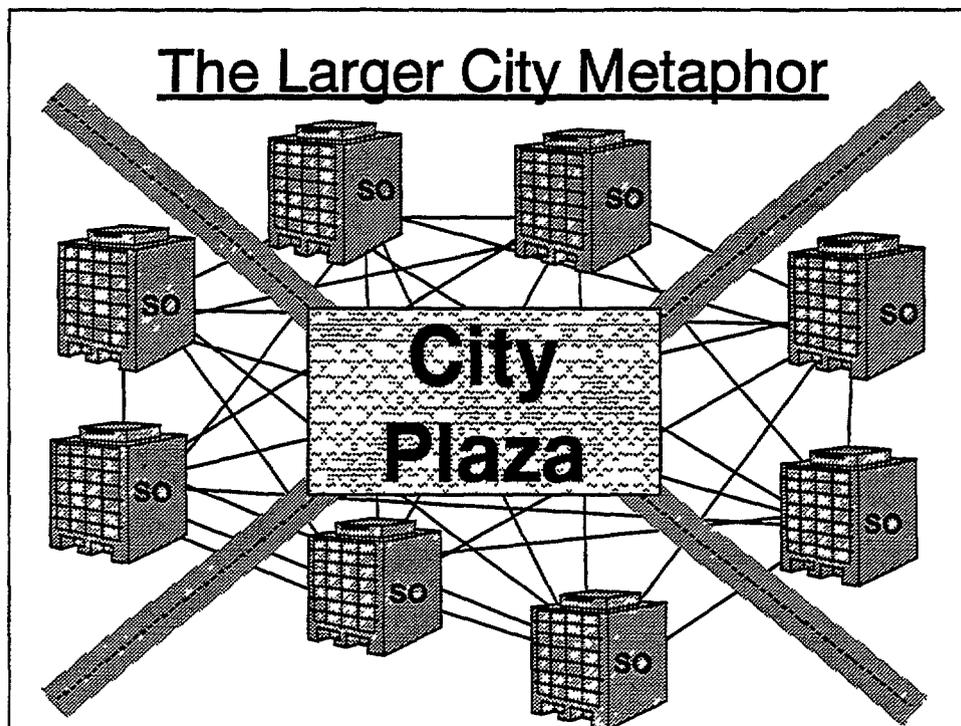
This slide presents an illustrative map for the proposed WebOPS web site. Continuing with the hotel metaphor, the layout suggests a crude hotel “floorplan.” The white space surrounding the floorplan is meant to indicate the Internet as a whole.

Salient points we’d like to make about this diagram include:

- The WebOPS site need not be “for members only,” for the site would feature a “lobby” generally accessible to the public (i.e., for public relations material).
- Other facilities would be available only to “guests with keys” (i.e., passwords) – a “business center,” where one could access a variety of groupware and applets dedicated to the design and modification of Results Frameworks, or “room service” access to a storehouse of team documents that could be ordered up at will.
- There would be “rooms” set aside for individual team members to store their personal work files (i.e., network privileges).
- There would also be “conference rooms,” where expanded team members could conduct virtual meetings, engage in chat groups, and work collaboratively on documents, slide packages, and other products.
- A “concierge” service would provide a variety of expert, or “wizard” functions to aid team members in certain planning, achieving, and judging activities. This would be the virtual equivalent of a help desk.



Another function of the “conciierge”/help desk would be to provide “hot links” to related web sites (hence the opening door image) This ability to gain “shortcut” access to other web sites of interest (e g , CDIE, World Bank, World Wildlife Fund, news agencies like CNN or the BBC) is not only useful in taming the Internet’s vast resources for day-to-day use by team members, but in avoiding replication of data already stored elsewhere (e g , the ADS series)



Still another image we've tossed around explores the potential for broader arrays of connectivity and opportunities for information sharing and dialogue. This image is of a virtual "city" where a plaza or central square provides common space for bulletin boards, forums, news, downloading of files, macros, and an array of productivity tools—in short, a marketplace of services where the WebOPS home page could be thought of as a "specialty shop."

The plaza would be a central web site that everyone could move into and out of without security concerns. Radiating out from the plaza, there would be a network of "avenues" and "streets" to various "neighborhoods" (analogous to each of USAID's bureaus). Internal to these neighborhoods would be a variety of "structures" such as the hotel metaphor described above. Levels of access to these could be secured and regulated as appropriate, but opportunities for internal and external communication would be facilitated, and opportunities for interaction and synergy within this "city" would equally be encouraged.

The hotel metaphor suggests that WebOPS be built on the level of individual Strategic Objectives, whereas the town plaza metaphor suggests something on the order of a mission-wide WebOPS structure. We spent a lot of time debating whether WebOPS should focus on establishing mission web sites or SO web sites. Good arguments were found on both sides, but we eventually settled on the SO-level approach simply to keep things "small and beautiful" at first, and because we felt that most matched the natural growth patterns of the Internet that we seek to emulate (i.e., "build it and they will link"). We believe WebOPS should be about creating good nodes that facilitate dialogue and collaboration, letting subsequent network linkages develop on their own.

Checking Out Potential Customers

- Customer survey designed to generate feedback on proposed IT development
- Assumptions going in
 - End-user expectations affect use
 - Understanding expectations = better design
 - Web-access increases access to information
 - Web-access increases mission-partner interactions, flexibility in person-to-person comms, and diversity in participants
- Types of questions we asked
 - What are Expanded SOTs using for IT now? Limits?
 - What IT needed for RF creation and revision?
 - What IT tools needed for collaborative management activities?
 - What IT tools needed for M&E?
 - Feedback on our proposed hardware/software standards

Even though we're merely in the design requirements phase, we decided it was never too early to start eliciting feedback from the field regarding how WebOPS should improve teamwork among Expanded SOTs. We therefore designed an initial customer survey for distribution over RFNET (forthcoming)

The purpose of this survey is to assess and receive feedback about the expectations, assumptions, and concerns about the proposed development of an information technology to improve interactions and communications between operating units and partners

Our assumptions going into this survey basically revolve around the notion that end-user expectations have a lot to do with how much any IT tool eventually gets used

We'd describe the survey methodology in the following ways.

- Open-ended questions to receive in-depth information on specific topics
- Analysis and reporting of findings
- Incorporation of findings into Phase II software development effort
- Submission of findings to USAID Ops Governance Team for consideration and possible action

The slide's final bullet above provides a listing of the types of questions asked in the survey. The complete draft survey is included as Appendix A

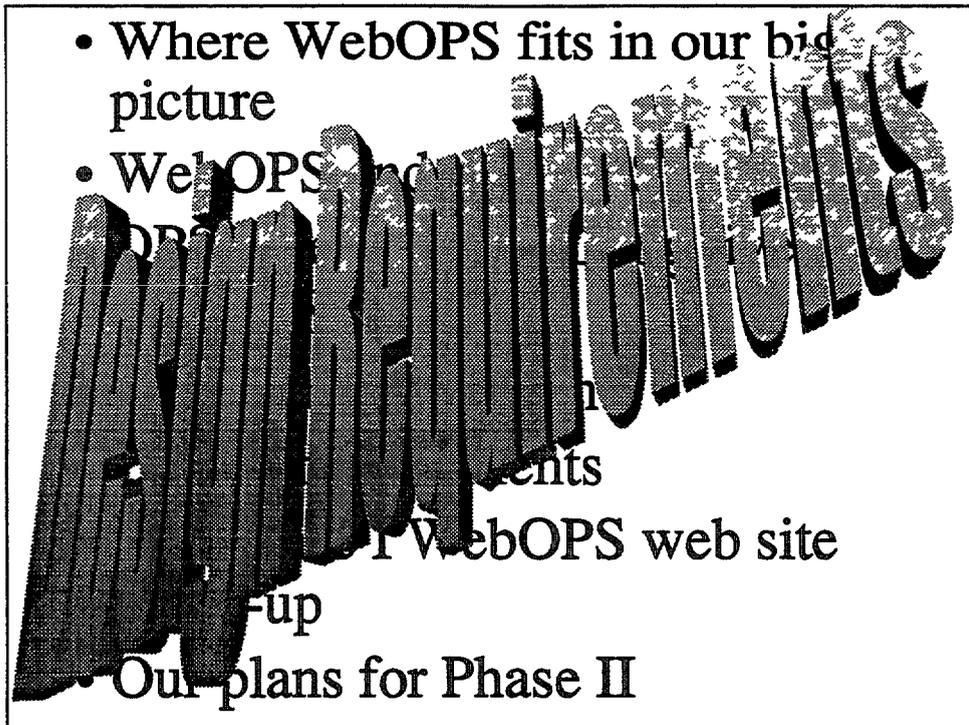
Connecting to the Real World

- Information culture think-pieces posted on RFNET
(*Connecting WebOPS to USAID's Real-World Problems*)
 - Getting people to think about new IT strategies
 - Previewing, and generating feedback on, WebOPS concepts
- Kathy Parker's essays
 - 1 Divergence between info culture and original OPS-BAA vision
 - 2 Potential end-user applications—Leland Initiative in Africa
 - 3 Information overload at USAID operating units
 - 4 Impact of PC networking on team decision-making
 - 5 Developing "netiquette" among users
 - 6 Issues in monitoring WebOPS

A continuing emphasis in the development of WebOPS has been to connect it as much as possible with the real world of USAID and its partners. As part of the effort, the CNAC study team focused resources on developing a series of essays, entitled "Connecting WebOPS to USAID's Real-World Problems." The essays focus on the role of information technologies and their use in the Agency.

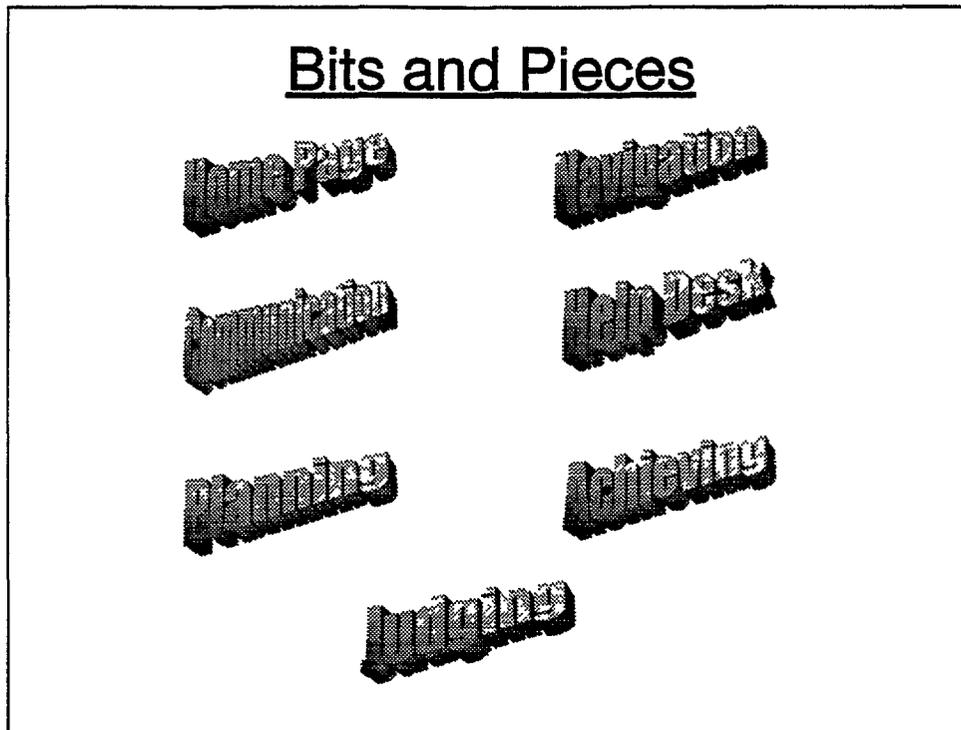
- Essay 1 explores how USAID sought to focus the OPS system on information technologies that would enhance its ability to learn about itself, its processes, and its performance, and to act upon new knowledge
- Essay 2 focuses on how to facilitate end-user access and use of the Internet, which is the centerpiece of the Leland Initiative
- Essay 3 focuses on information overload and how WebOPS will make communication easier and information more accessible
- Essay 4 focuses on the challenge of new computer tools for communications and decision-making
- Essay 5 focuses on some of the challenges of human interactions via computer-mediated communication, and suggests that much of these interactions may not be covered by existing norms or rules
- Essay 6 focuses on monitoring WebOPS' effectiveness, efficiency, and impact.

Abstracts of all six essays are provided in Appendix B



In this section we summarize the separately published *WebOPS Design Requirements* report. A separate “Functional Specifications for WebOPS” document is included in this report as Appendix C

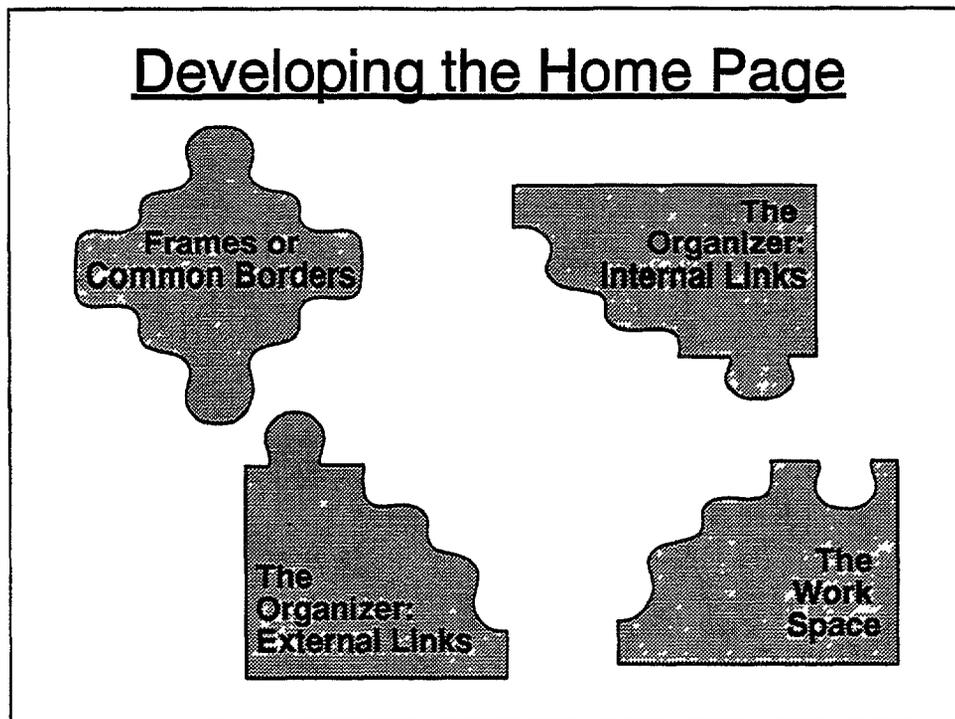
WebOPS's primary task is facilitating dialogue between missions and partners (plus among partners) by enabling real-time (when possible) transparent access by users both internal and external to USAID. The equipment or hardware may be the same as that needed for the NMS (or its successor) and other USAID IT operations, but the supporting tools (e.g., software) are different.



This slide presents the seven major software development tasks considered in WebOPS' design requirements document. Each will be treated in more detail in subsequent slides

As for WebOPS' general requirements, we'd note the following

- Must be user friendly
- Must enable improved communication and information sharing
- Must take advantage of available COTS and provide a suite of software
- Must take maximum advantage of technology trends and move toward being an Internet-based environment
- Must be able to use on a PC with Internet access
- Must ensure maximum integration between planning, achieving and judging components of USAID reengineering
- Must have maximum flexibility to change as new software becomes available or new needs/demands from primary end-users are identified
- Must have highest degree of compatibility with IBM-compatible systems
- Must have hardware and software compatibility with the NMS or its successor
- Must minimize costs to users
- Must have high degree of potential for sustainability
- Must be easily maintainable

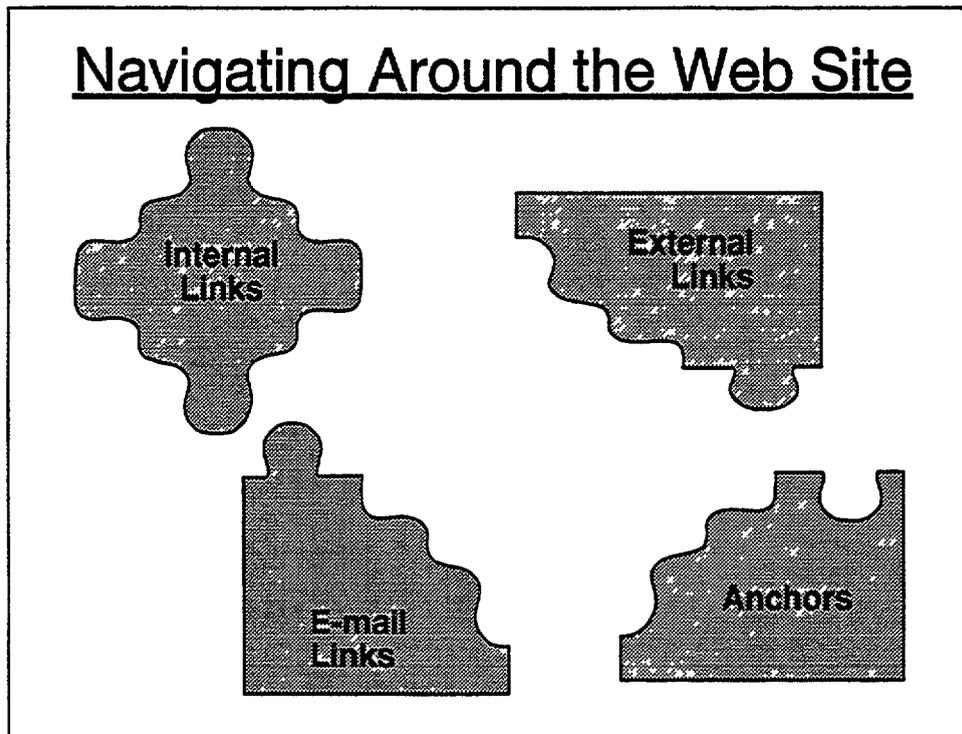


Frames or common borders will be used on the Home Page. One frame or segment within common borders will be an organizer for reference, the second will be a work space for use by partners on Expanded Strategic Objective and Results Package Teams.

The Organizer provides details on how the web site is organized. It contains the following navigation buttons: internal or local links to other pages on the web site (e.g., welcome, overview, description of major features), and external links to tools, resources, procedures, and "current status" reports.

The Work Space frame on the Home Page is the place where applets will be active and used by Expanded SO Teams, Results Package Teams, and Activity Managers. This frame provides individual or shared space for viewing graphics and documents, E-mail and E-conferences, white boards and bulletin boards, chat groups or forums for asynchronous interaction, word processing, and other work-related tools and software.

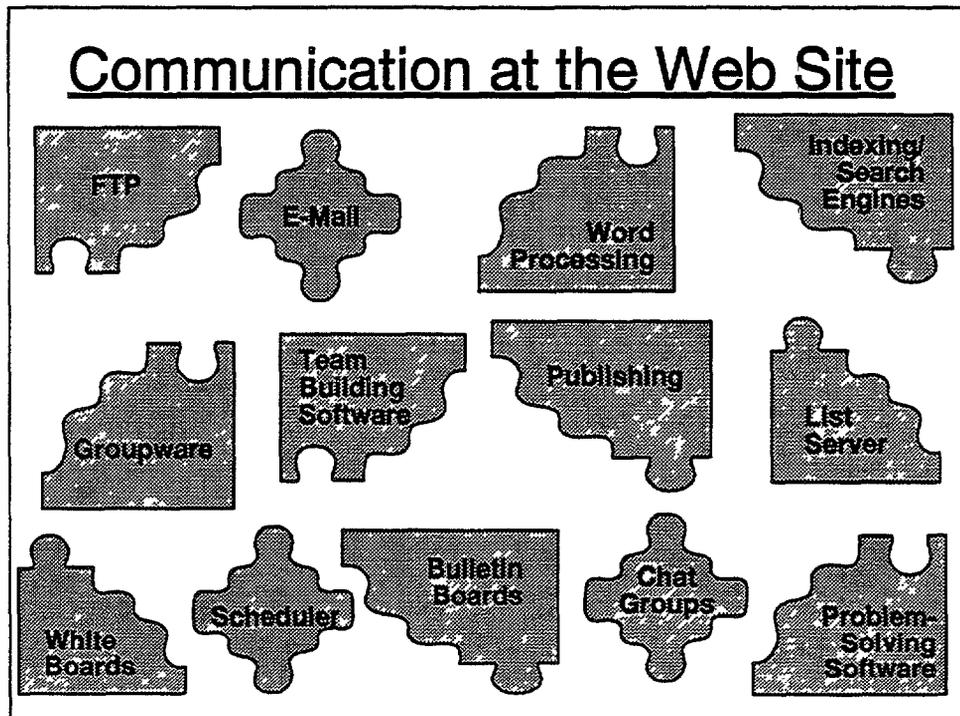
The WebOPS home page will open with a hotel floor plan, the metaphor used in designing the original vision of WebOPS. It will have an explanation of WebOPS, its objectives, what it does, and how it works. Clicking on the hotel lobby portion of the graphic will open a mini-site map rendered in the shape of the Expanded SO Team's Results Framework, with hot-button links to component Results Packages viewable in a variety of perspectives. This provides teams with a direct focus on the development efforts they deal with on a daily basis.



In terms of navigation, WebOPS will have the following links

- Internal links—to other pages in a given web site
- External links or “hot links”—to other web sites (i.e., with different domain names) with relevant information
- E-mail links—a pre-addressed E-mail form for direct messaging by a user to the webmaster, RPT leader, Expanded SO Team Leader, etc

WebOPS’ anchors will allow users to jump to another part of a long page



E-mail provides a communication link between various users. There are intranet systems such as Banyan Mail, currently used by USAID staff. There is also an array of E-mail software packages and services providers. A conventional commercial E-mail arrangement can be used with WebOPS.

FTP allows you to transfer files from one place to another. Among other transfers that WebOPS will permit (e.g., using "ftp client") is the transfer of files from one computer to another (uploading or downloading).

WebOPS will provide access to team building software. There will be team space with real-time talk interfaces. There will also be personal file storage for members-only access, opportunities for virtual teaming, etc.

Groupware is web-based software that can be used by participants to set up meeting agendas, include user-entered remarks, and voting. Groupware is usually textual, but with HTML tags can provide opportunities to link to graphics or other pages on the World Wide Web (WWW). An important aspect of groupware for teams is that different users can have different access rights.

WebOPS will provide teams with access to virtual white boards. The purpose is to provide team members who may be working at different geographic locations with a consistent picture of their work as if they were drawing, writing, sketching, concept mapping, etc., on the same board.

WebOPS will provide Expanded SO and RP teams with bulletin boards that allow interactive message exchange. They can also create an online community and provide for information exchange and "talk" forums.

[Previous slide text continued]

Chat groups provide for asynchronous interactivity via text shared among members of Expanded SO or RP teams. At present, audio COTS do not provide the possibility of more than two individuals "chatting" at a time. However, Text Talk allows participants to queue up and indicate their interest in being next in line to comment.

WebOPS will be investigating opportunities to include appropriate problem-solving software. Most of it has been developed and used in the industrial and technology realms, and thus has little direct applicability for sustainable development activities. However, the main function of this kind of software (and the reason to attempt to access it for use by teams) is that it facilitates human reasoning and helps team members reach more logical conclusions. Some of the key features are clarification of problems, analysis of causes of the problem, development and selection of appropriate solutions, and proactive planning operations that facilitate teamwork.

WebOPS will provide a tool for indexing and searching relevant information in graphic and/or narrative formats, identifying subjects wherever they appear for cross-reference purposes.

COTS provide a variety of word processing software. Some of those that are being considered include Corel 8 with Word Perfect and Microsoft Office's Word 7. These provide users with text production capabilities that can be shared via attachments, faxed, published, archived in a library, or otherwise made accessible (as appropriate) to other team members.

WebOPS' primary purpose is to improve communication among Expanded SO Team and RP Team members. It is not intended to be a tool to generate better information to report to USAID/W and subsequently to Congress, however WebOPS will be able to do that as well. WebOPS will provide a way to "publish" the Results Framework in a variety of ways, to include on-screen view, printable, send to, E-mail, etc.

Each RP Team can provide information via a newsletter/listserv communication tool. Participants in an RP Team will be given access via a password. Group discussions can maintain a degree of privacy dependent upon the norms established by the RP Team.

An address or scheduler capability will provide information about dates, agendas, and pre and post-meeting activities. The scheduler can set face-to-face meetings, as well as virtual meetings via computer.

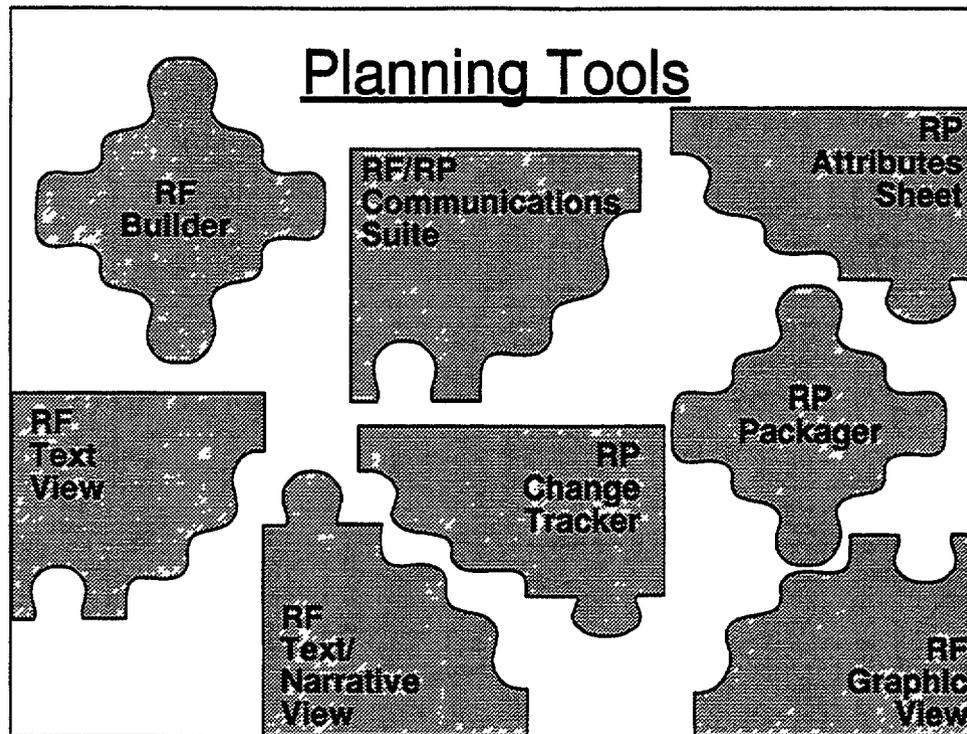


WebOPS will provide wizards to aid the user in the various tasks of building and developing RFs and RPs. Key attributes of the RF wizard will be answers to such questions as

- Where to place boxes, select default shape or customize to individual Expanded SO Team needs, and how to number them
- What information to include in each box
- How to frame results statements
- How to articulate development hypotheses
- How to make links that demonstrate lines of causality

WebOPS will provide USAID staff and partners with access to internal and external links, as well as search engines that provide relevant information on the context in which sustainable development efforts take place. Context builder will provide a set of questions about the development context (e.g., macro economic issues, demographic factors, existing policy framework, activities of other donors) for a given Strategic Objective. It will provide hot links to other documents that provide substantiating information of use to team members. It will also provide access to scenario development software which allow team members to ask questions and respond to “what ifs”

The wizard for the Results Packager will provide answers to questions about how to create a Results Package based on management efficiencies and/or causal linkages between Intermediate Results, as well as ones concerning personnel assignment, delegations of authority, results tracking, etc



WebOPS will provide improved graphical and textual documentation of Results Frameworks that can be shared among team members and others who desire access to the graphic and text formats on the Internet. This will eliminate previous problems associated with a lack of a common graphics capability to send and receive RFs, except by mail or fax. RF Builder will provide for graphic and textual views of RF details to enable tracking of USAID- and partner-funded IRs, as well as membership, documents and meetings related to IRs. The RF Builder will also provide communications capabilities for Expanded SO Team members to work on the RF since it is intended to be a living document in a learning organizational context.

RF Builder will provide a means to update existing RFs as teams work through the iterative process of development. This would include a default function that provides for a change in the date of any updated versions.

RF Builder will also provide a means for tracking changes made over time. Key attributes to be tracked and recorded include who changed what, explanation of why something was changed, and when a change was made.

This kind of information will provide a historical record of the development and evolution of any given RF. This might be useful for sharing the history of the development of the vision with new team members, communications with non-team members about the reasons certain decisions were made, and responding to requests for information from other mission and USAID/W.

[Previous slide text continued]

WebOPS will provide a default template for constructing an RF. It will allow users to define and name their own template, if they so desire. Also, as changes are made in the RF that may affect the configuration of a given Results Package, there will be a prompter, or task reminder, to indicate potential changes in the RP that need to be discussed.

The graphic view of an RF will be able to capture the following attributes:

- Strategic Objective
- Intermediate Results
- Linkages (i.e., causality between results and between Intermediate Results and the Strategic Objective)
- Results Packages
- Links to Performance Measurement Plan Template and Target Data templates
- Documents relevant to the development of the Results Framework to which readers might want to refer for more detailed information

WebOPS will include hypertext capability that is adequate to “capture” the substantive aspects that are portrayed in the RF graphic (e.g., Strategic Objective, Intermediate Results, development hypotheses, key indicators).

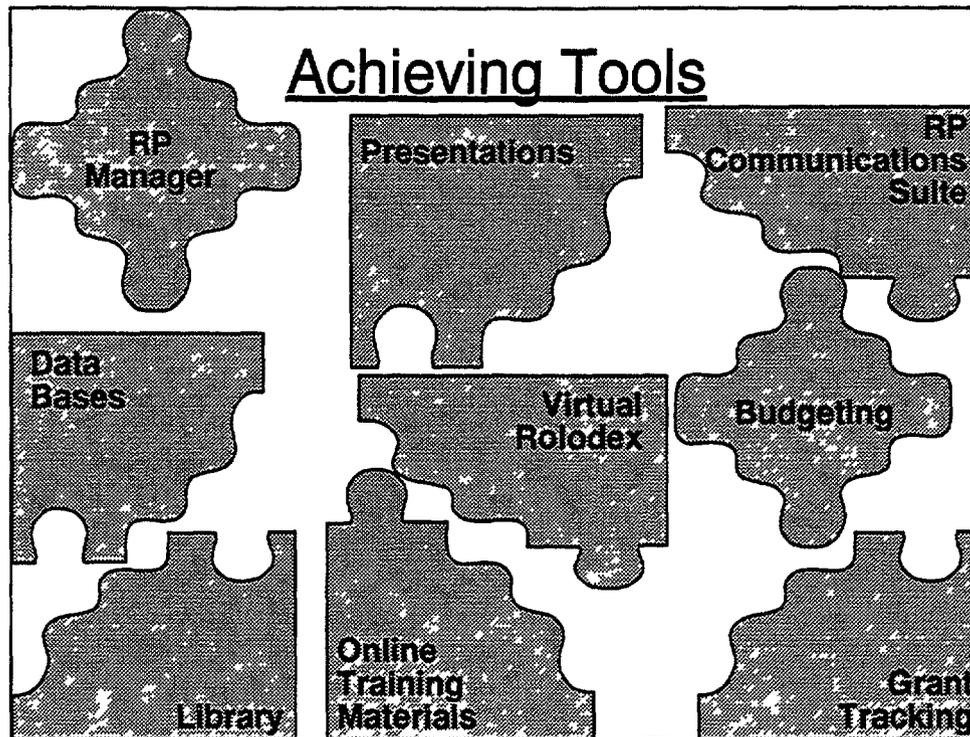
RF Builder can access a variety of communications software capabilities for team members to interact in either a real-time or asynchronous manner.

WebOPS will provide a graphical tool to partition the RF into Results Packages (the “Results Packager”). Administratively linked aspects of the RF, such as a Results Package, can be distinguished.

WebOPS will provide a means to update existing RPs. As changes are made in the RF that may affect the configuration of the RP, there will be a prompter to indicate potential changes in the RP that need to be discussed.

The properties sheet will outline the attributes of a Results Package, such as members, Intermediate Results, activities, delegations of authority, resources available, etc.

As for communications, the RP team should have access to software and hardware that provides a discussion, or—minimally—an E-mail communication across an RP Team.



The Results Package manager will be comprised of a suite of productivity-enhancing tools. They will include many of the communications tools described above, as well as tools for budgeting, grant tracking, presentation making, scheduling, contacts/rolodex, training, library referencing and database accessing.

WebOPS will provide a budget and accounting spreadsheet type software, such as Microsoft Excel 7, that can be used for tracking personnel, fiduciary expenditures, materials inventories, and other relevant materials. Many COTS exist that can be customized by users.

WebOPS proposes to access a MERIT-like program for tracking grant funding. MERIT was developed by USAID/South Africa and provides the capability to track numerous grants in any portfolio.

WebOPS will provide a slide graphic presentations program. Again, COTS, such as PowerPoint are available. They provide a visual means by which to structure a presentation, including text, charts, pictures, and other graphics.

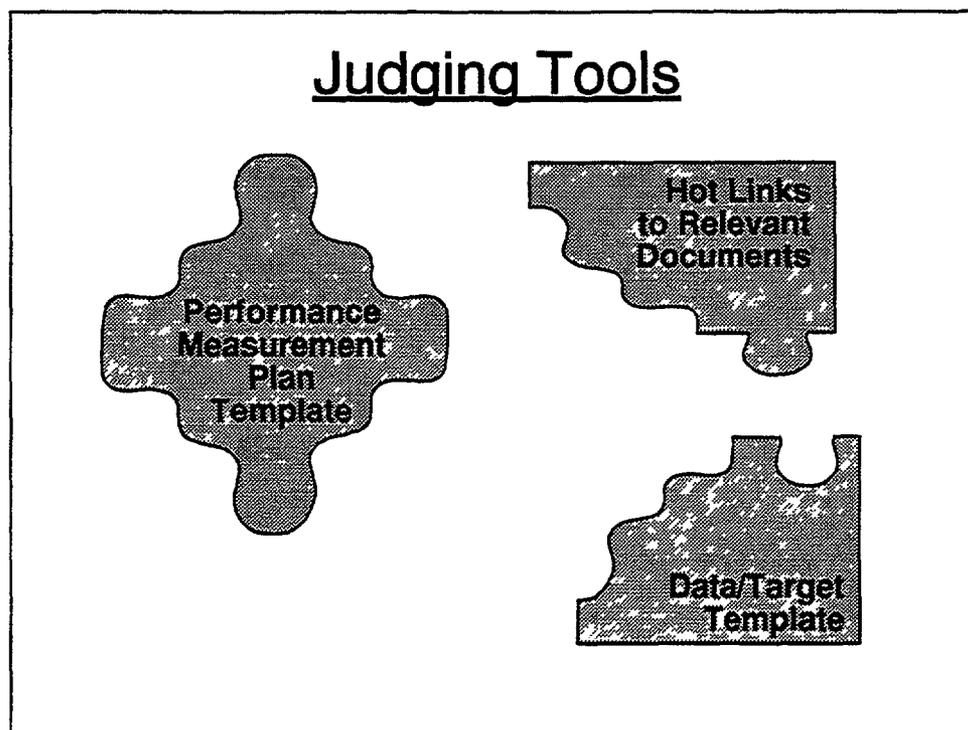
A variety of COTS provide opportunities to "capture" information systematically about individuals with whom team members have contact.

[Previous slide text continued]

WebOPS will provide access, via hot links, to existing online training materials (e.g., Africa Bureau's SD Datacenter) and other training manuals

WebOPS will provide a library archiving and searching function. Materials such as the ADS manuals, USAID definitions, and reengineering documents can be accessed and searched. There will be a sourcebook of same-sector research/data that can be customized by individual Expanded SO or RP teams to ensure that all relevant information is readily accessible to all members. The library will also have hot links to other sites (e.g., FAO, World Bank) that provide additional access to relevant materials.

WebOPS will provide access to COTS database software that can be used by the team to input data relevant to its own activities. It will also provide hot links (that can be customized) to other databases (e.g., partners' reporting systems), as well as other online databases that may be of benefit.

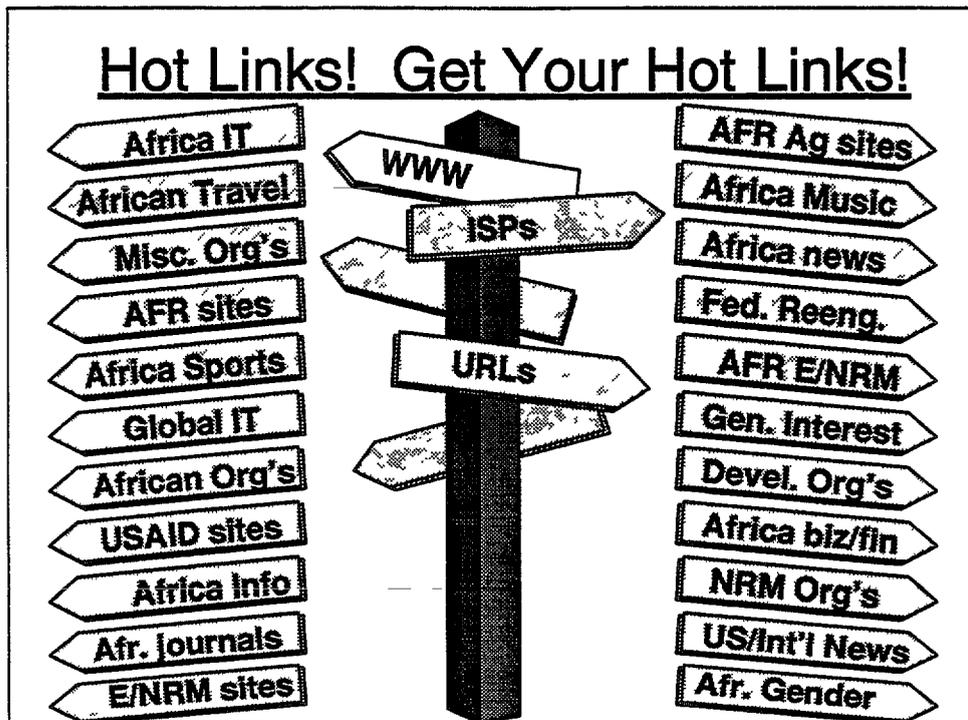


As with other templates and graphics, WebOPS will provide a default for construction of judging tools. However, it will allow users to delineate or define their own template if desired.

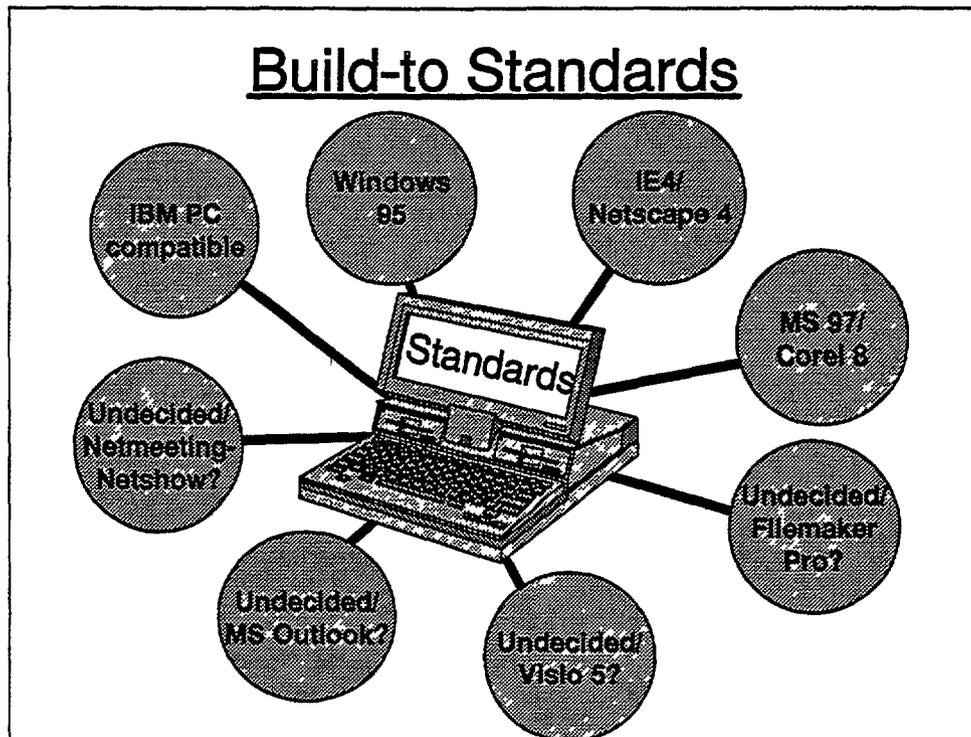
The PMP template serves to organize information on indicators being used to measure progress toward achievement of results outlined in a Results Framework. This serves as the matrix for the development and presentation of a Performance Measurement Plan (PMP).

The Data/Target template shows expected and actual targets for each indicator outlined in the Performance Measurement Plan.

Through the use of hot links, any number of documents will provide detailed information on the data and information that appear in the templates. These documents (e.g., quarterly reports, special studies, government documents, donor documents) can be accessed as needed (and as made available on the Internet by USAID and its partners and customers).

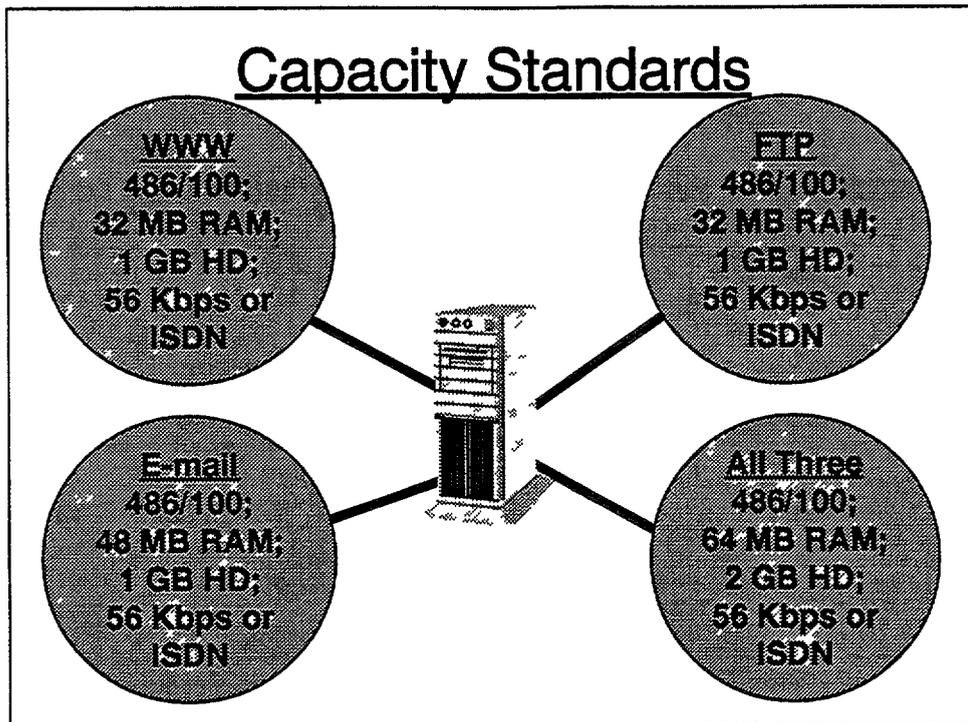


As a way of demonstrating the great variety of web sites out there on the Internet to which hot links from WebOPS sites could logically be made, we compiled a list of over 200 existing sites we thought any Africa Bureau/ Natural Resources Management Expanded SOT would be interested in having. The sites are divided into 22 categories, which are displayed on this slide. The complete list appears in Appendix D.



We are building WebOPS to meet the general standards for hardware and software as displayed on this slide

- *IBM PC-compatible* refers to hardware
- *Windows 95* refers to an operating system
- *Internet Explorer 4/Netscape 4* refer to web browsers
- *Microsoft Office 97/Corel Suite 8* refer to a productivity suite
- *Filemaker Pro* refers to a database manager
- *Visio 5* refers to a charting program
- *Microsoft Outlook* refers to a groupware suite
- *NetMeeting/Netshow* refers to an interactive conferencing suite



Three issues are central to capacity planning

- the levels of service you expect to provide a user
- the applications and contents you require to meet the purpose of the site
- the hardware and software systems that the applications are to run

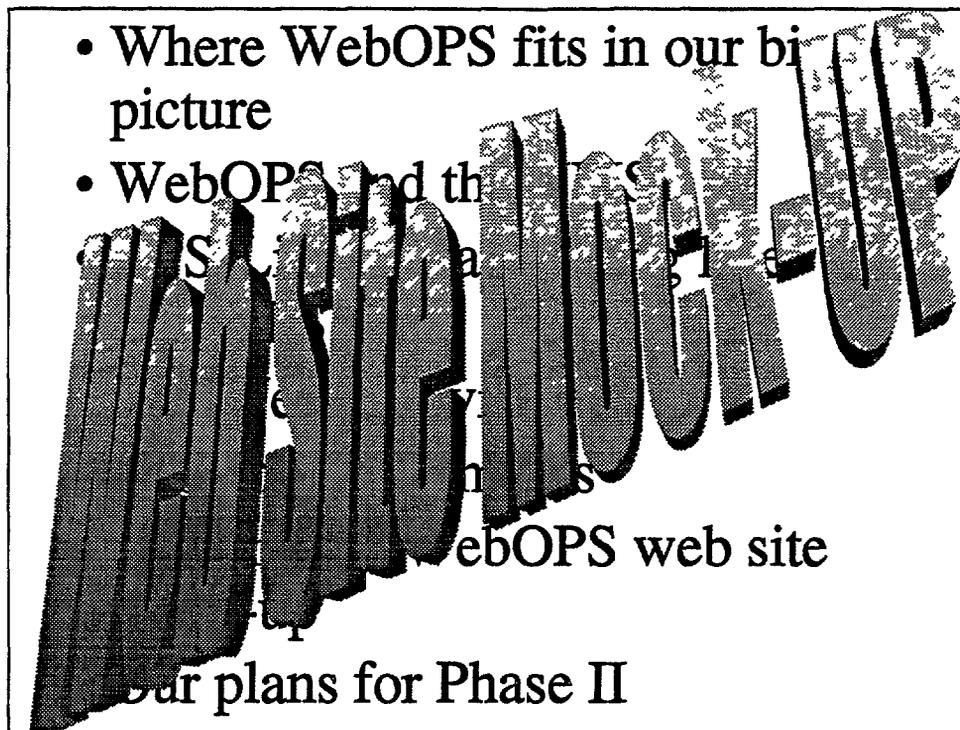
Several capacity planning tools are available in the market. BGS, Optimal Networks, Make SYstems, NetSys Technologies, Eshbel Technologies, and Benchmark Factory are some of the vendors with current offerings. There are online resources and excellent articles, as well as books that attempt to deal with this issue.

A number of factors define the bandwidth requirements for WebOPS. For example, the number of simultaneous users affects bandwidth requirements. Please note that the capacity levels listed above for the World Wide Web (WWW), File Transfer Protocol (FTP), and E-mail are those for a user range of 5 to 20. Ranges above 20 users generally require significantly greater capacity rates.

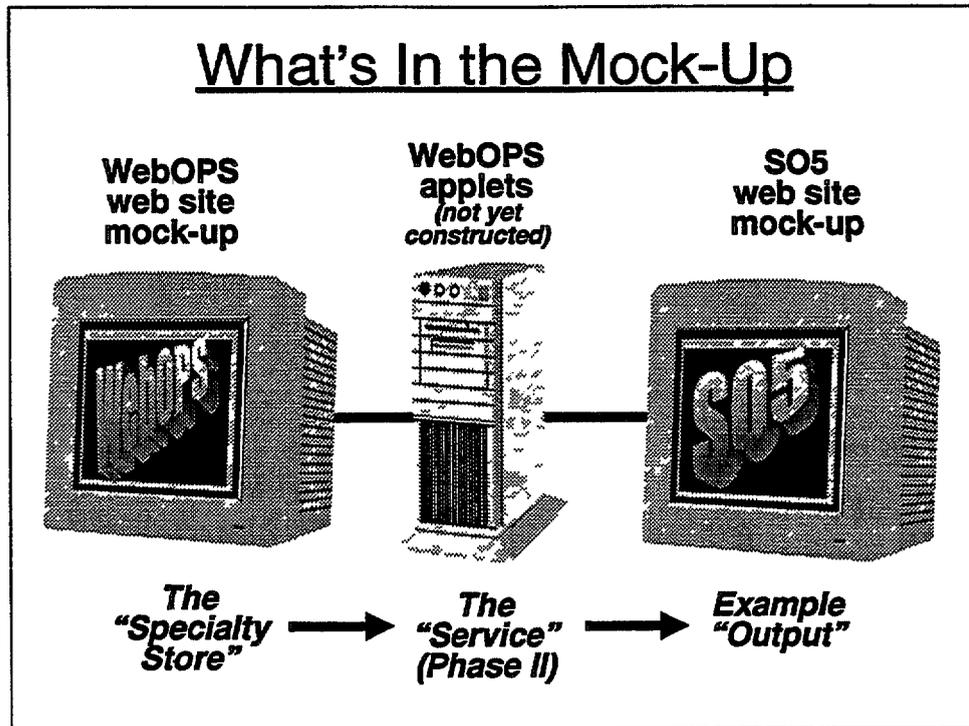
The content of WebOPS is another factor that will affect bandwidth—the more graphically oriented the content is (the RF Builder, RF Packager are essentially graphical tools), the higher the bandwidth requirement will be.

Another factor is the amount of traffic—a large amount will increase bandwidth requirements.

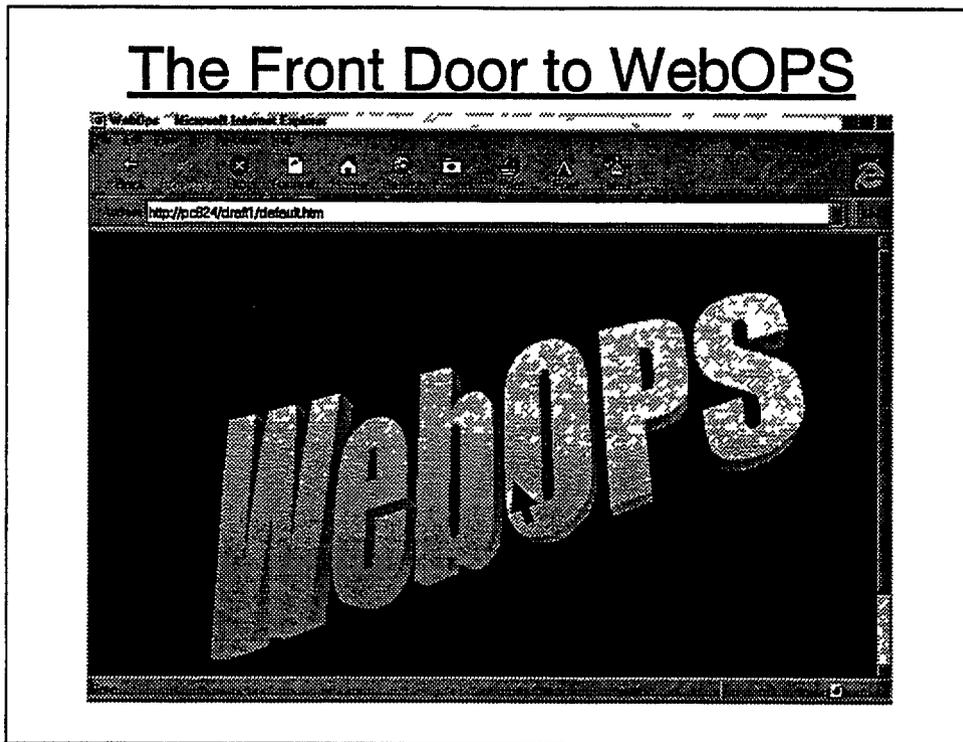
The security and fault tolerance aspects have deliberately been omitted from this discussion. Both aspects are additive and increase the need for hardware resources.



In this section we give you a sense of what WebOPS could look like by showing you a series of screen captures from our web site mock-up

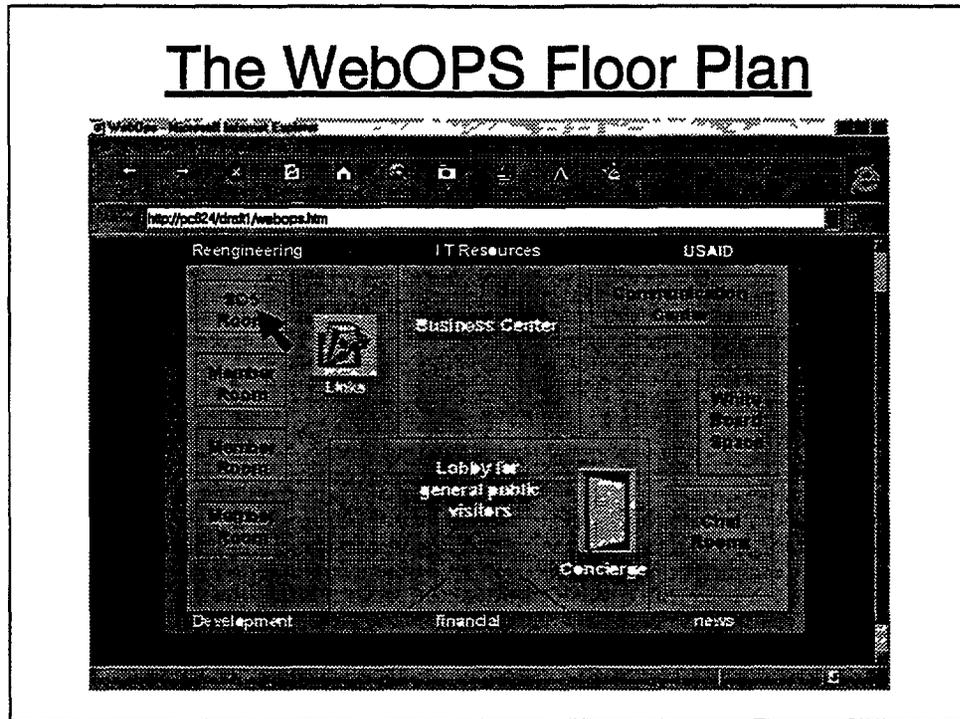


At this point in our effort, we're limited in what we can show you in a web site mock-up of what WebOPS ultimately will be. This is because the services that the WebOPS home page will provide operating units (looking to create their own copies of WebOPS for individual Strategic Objectives) are not yet created. What we can show you in the following series of screen captures is this: a mock-up of the "specialty store" (i.e., the proposed WebOPS home page), as well as a mock-up of an example "output" (i.e., Strategic Objective #5 of Africa Bureau's Office of Sustainable Development).



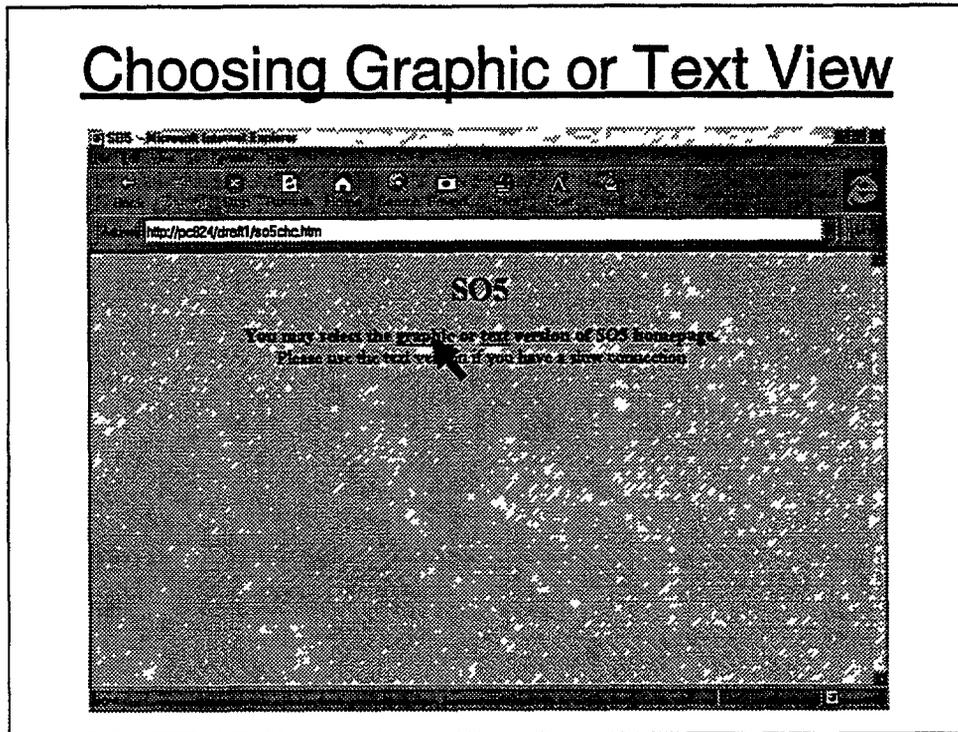
This screen capture displays the front page of the WebOPS mock-up, currently housed on a server at CNAC headquarters at the URL listed above. This is the first screen you would encounter upon visiting the WebOPS home page. The sign itself is a hot link to a subsequent screen (meaning you locate your pointer on the image and double-click to proceed farther into the site).

This screen capture and all others that follow employ Microsoft Internet Explorer 4 as the web browser.

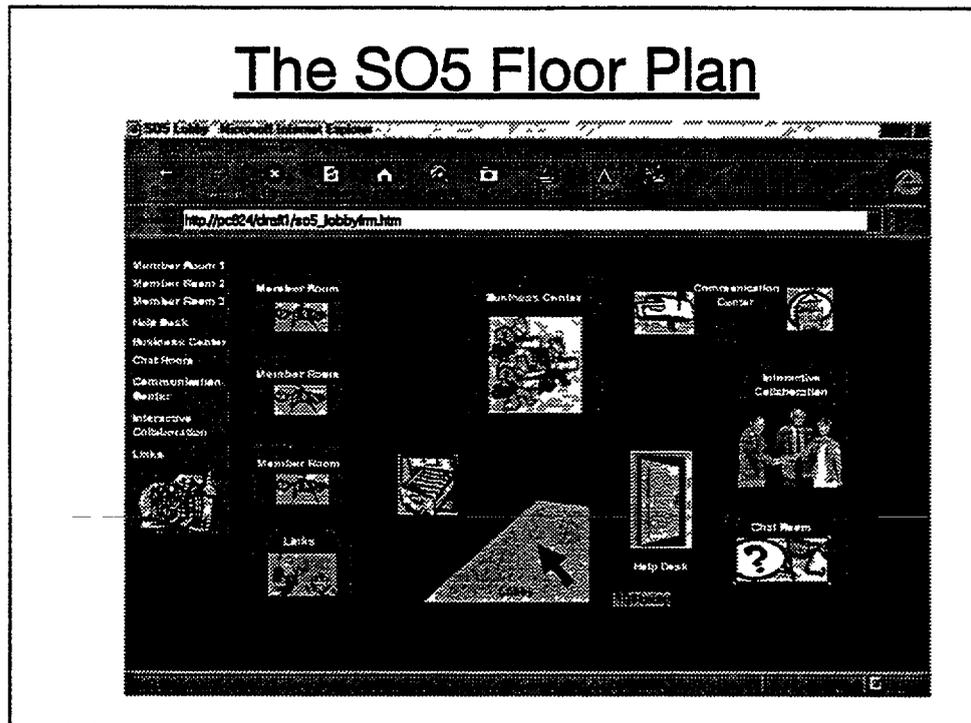


In this screen capture, we present a mock-up version of the WebOPS “hotel” floorplan that you saw earlier in the presentation. Around the floorplan are hot links to a variety of link lists (reengineering, IT resources, USAID, development, financial, news)

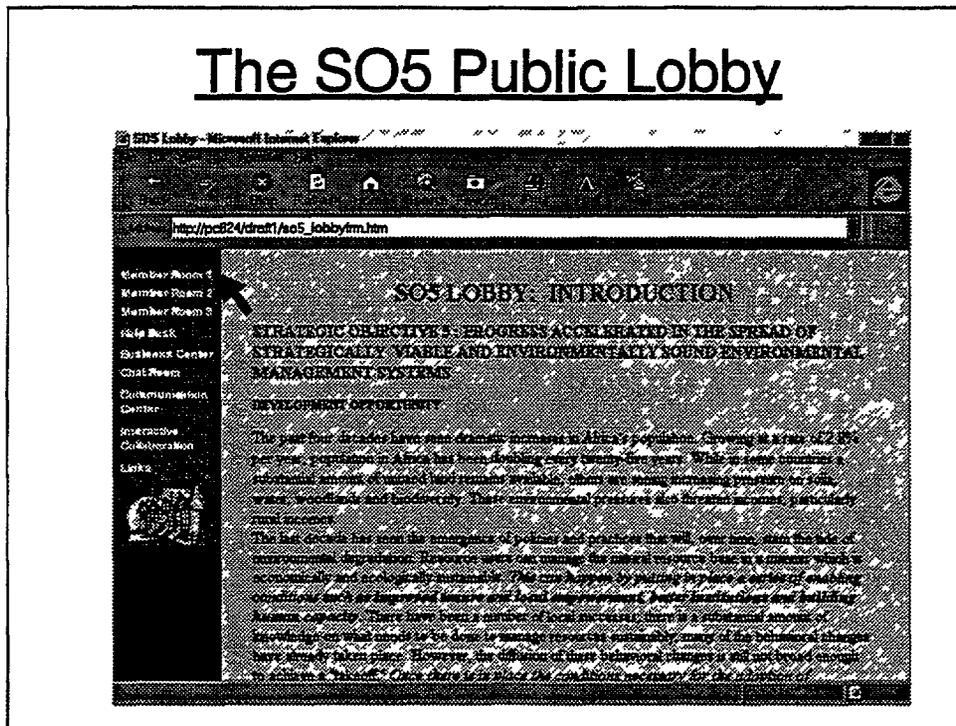
As you can see, one of the member rooms has been designated for SO5. By double-clicking on that box, we are immediately carried to the mock-up of SO5’s “hotel” floorplan.



Before entering the SO5 web site, you are asked to choose either graphic or text version. The text option is for those users with slower modem connections. This is an example of accommodating IT “handicaps”

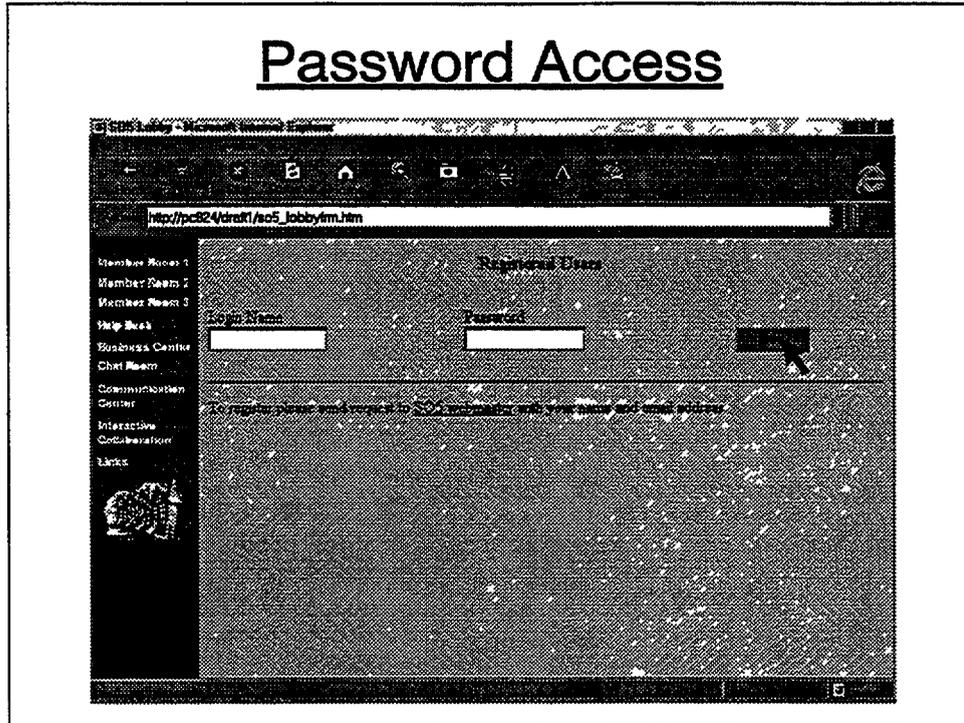


We are now in the graphic version of the SO5 WebOPS-style home page. By double-clicking on the Lobby icon, we immediately go to the publicly-available information on SO5.



Once in the SO5 public Lobby, we can read documents describing the Strategic Objective and its associated team

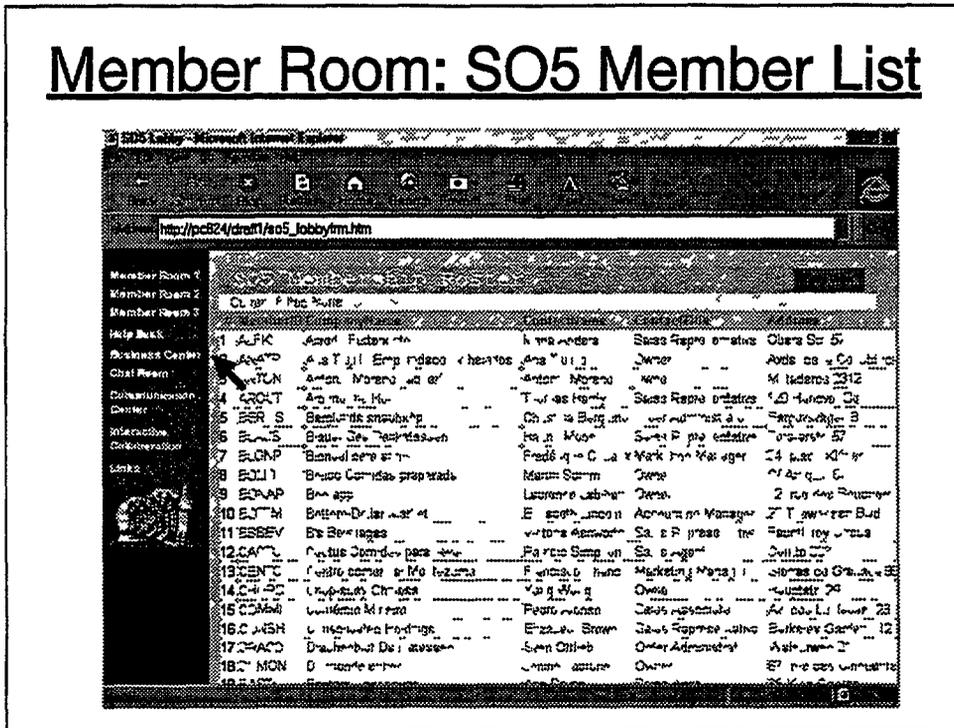
Moving on, we double-click on the Member Room 1 hot link located on the mini-site map to the left. By doing so, we are leaving the public-accessible part of the SO5 web site and going to a members-only area.



Having attempted to enter a members-only area, we encounter a password gateway, where we must enter our Login Name and Password to show that we are Registered Users. Registering as an official user is done through the web site's official webmaster.

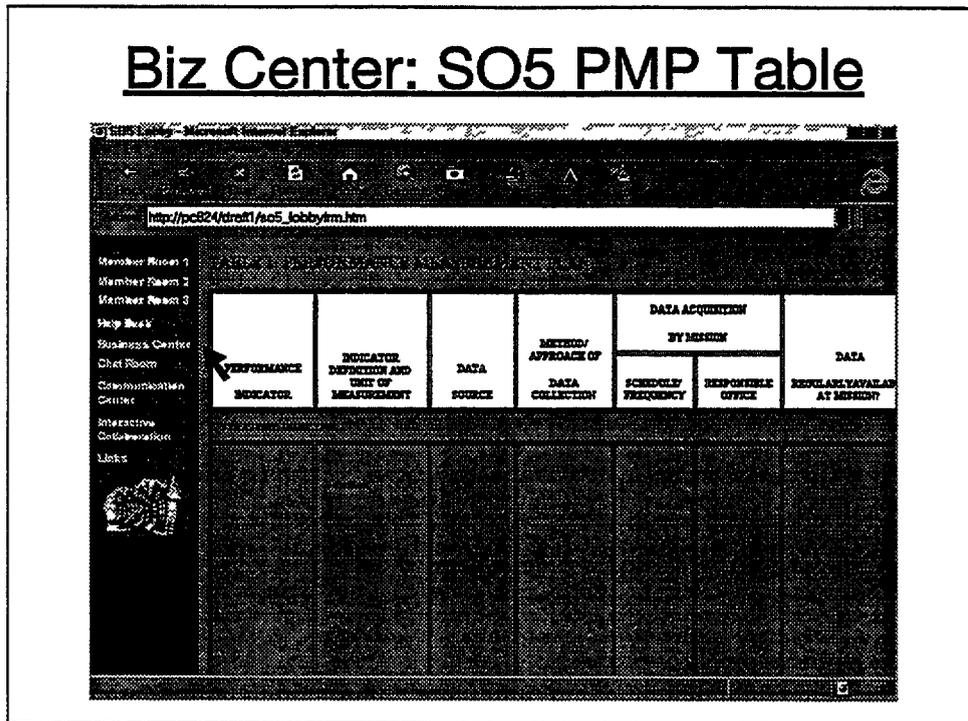
Once the information is entered, we double-click on the Enter button to continue the process of accessing Member Room 1.

Member Room: SO5 Member List

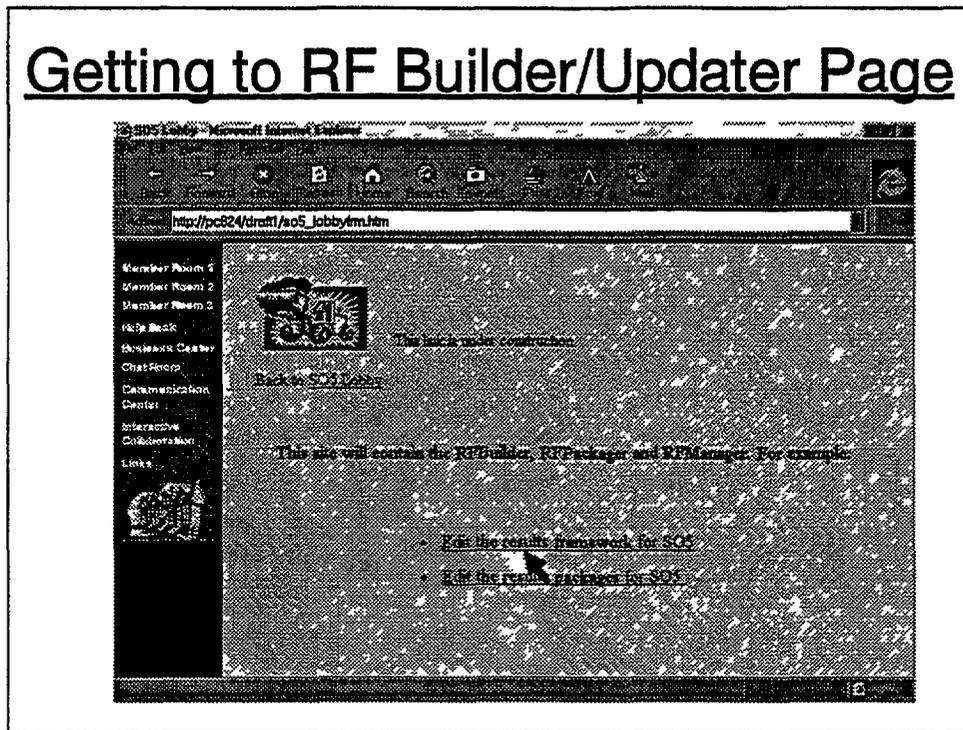


Once inside Member Room 1, we can access team files, such as the SO5 Membership Roster

We now leave Member Room 1 by double-clicking on the mini-site map at the Business Center listing



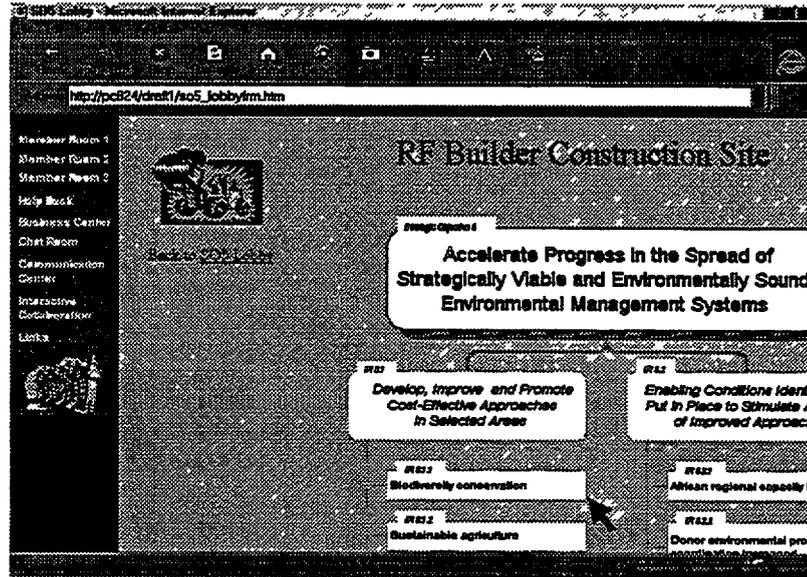
Once inside the Business Center, we access an existing template for the Performance Measurement Plan (which we have added to our mock-up)
 By double-clicking once again on the Business Center listing we go to another application within the center



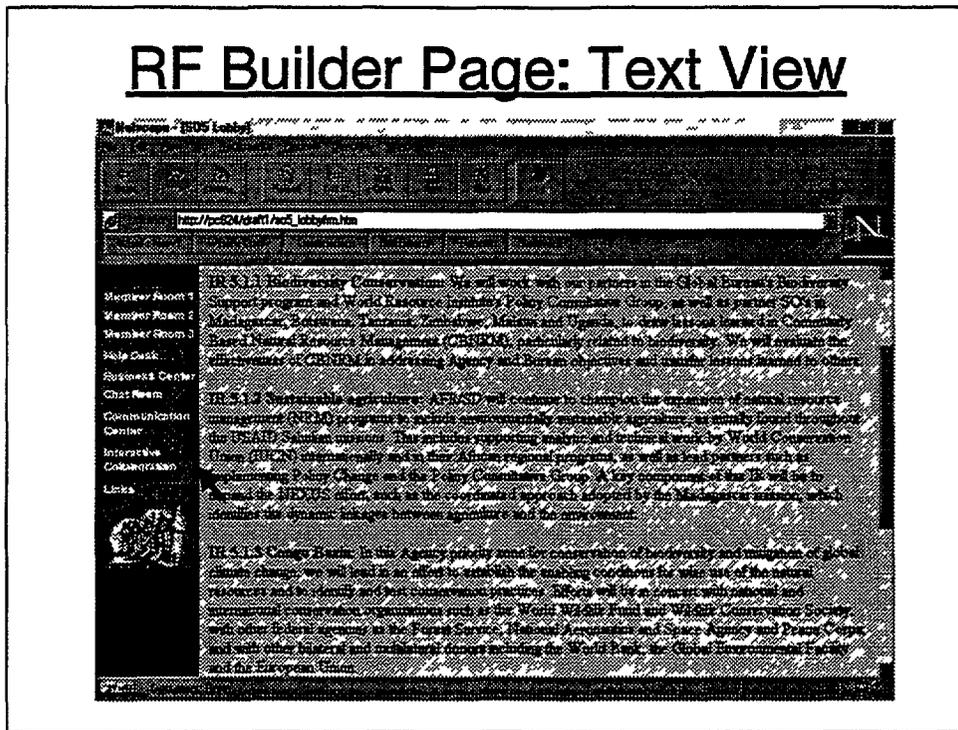
Here we arrive at the portion of the Business Center site that is under construction. It will ultimately contain the RF Builder, the RF Packager, and the RF Manager applets

For the purposes of the mock-up, we have already entered the Results Framework for SO5. By double-clicking on the hot link, we immediately go to SO5's RF file

RF Builder Page: Graphic View

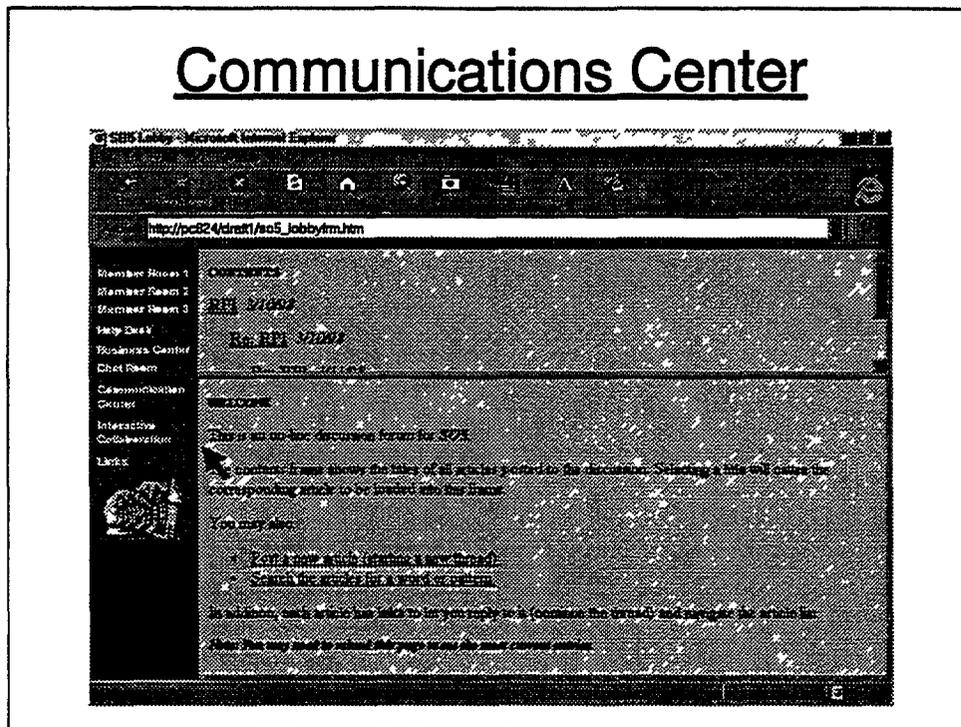


Once in the RF file, we still have the option of switching over to the text view if we wish to read any portion of the RF in greater detail. In this instance, we double-click on the box "IR5 1 1/Biodiversity Conservation "



We are now in the text-view format. By double-clicking on the IR5 1 1 hot-link box, we were taken to that portion of the narrative text associated with SOS

We now exit the RF file and enter the Discussion Group within the Communication Center by double-clicking on the mini-site map to the left (skipping the step that returns us to the graphic view)

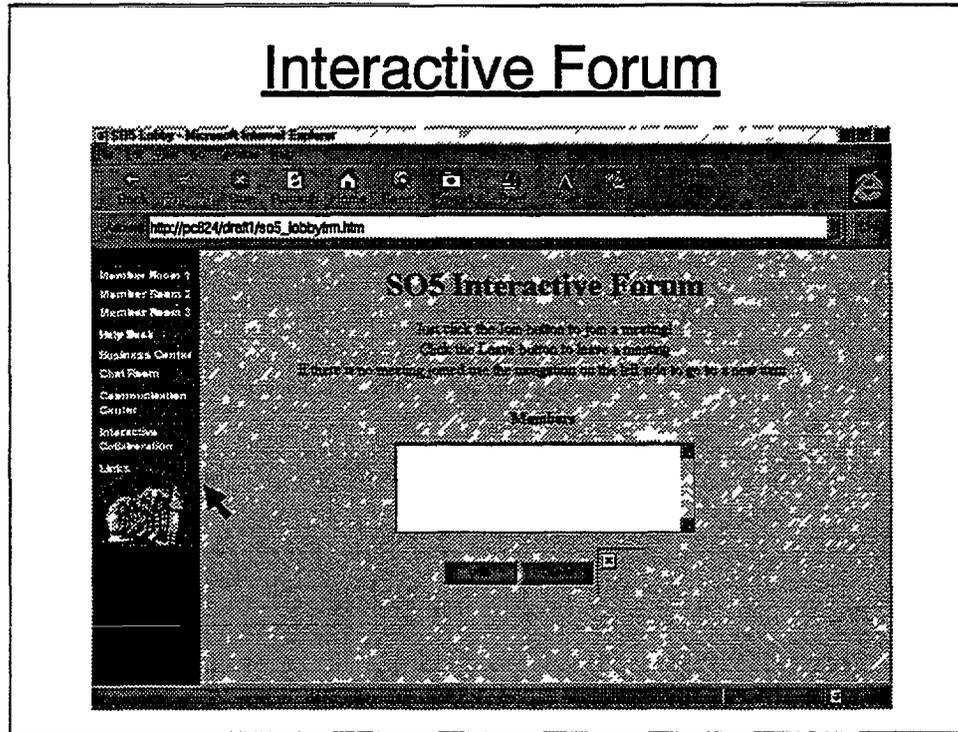


Once inside the Communication Center’s Discussion Group, we can join an on-line discussion concerning SO5 by posting a new article We can also review the previous discussion

This feature of WebOPS is similar to the “listserver” function played by the various NETs populating USAID’s global intranet (e g , RFNET, RFTechNET), but it is automated and thus does not require a human moderator (although one can be employed, if desired)

We now leave this portion of the web site and enter the Interactive Collaboration area by double-clicking on the mini-site map to the left

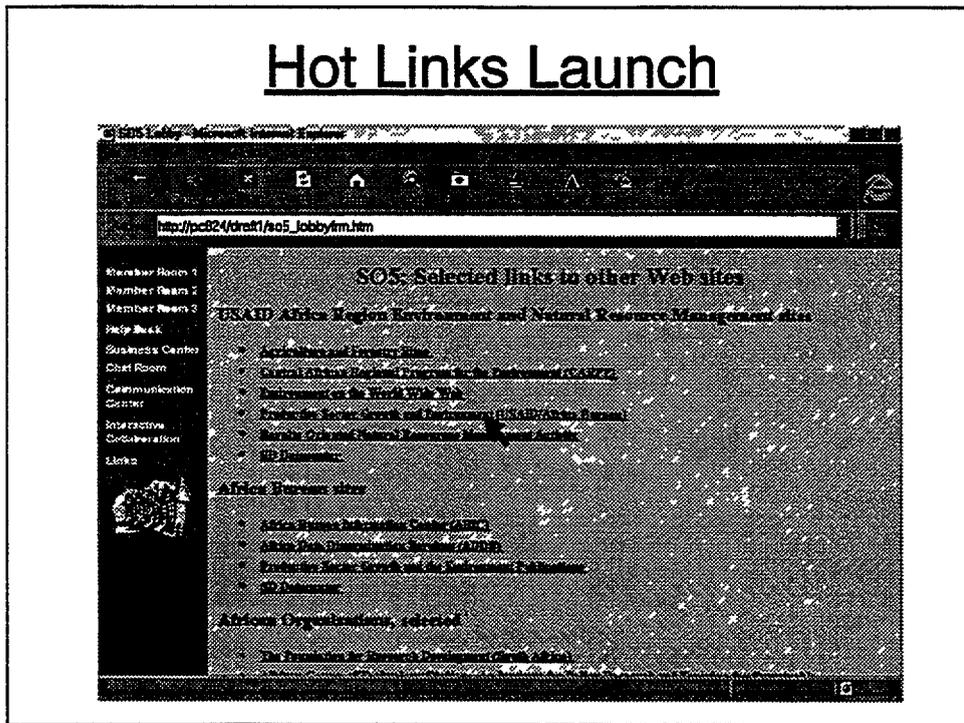
Interactive Forum



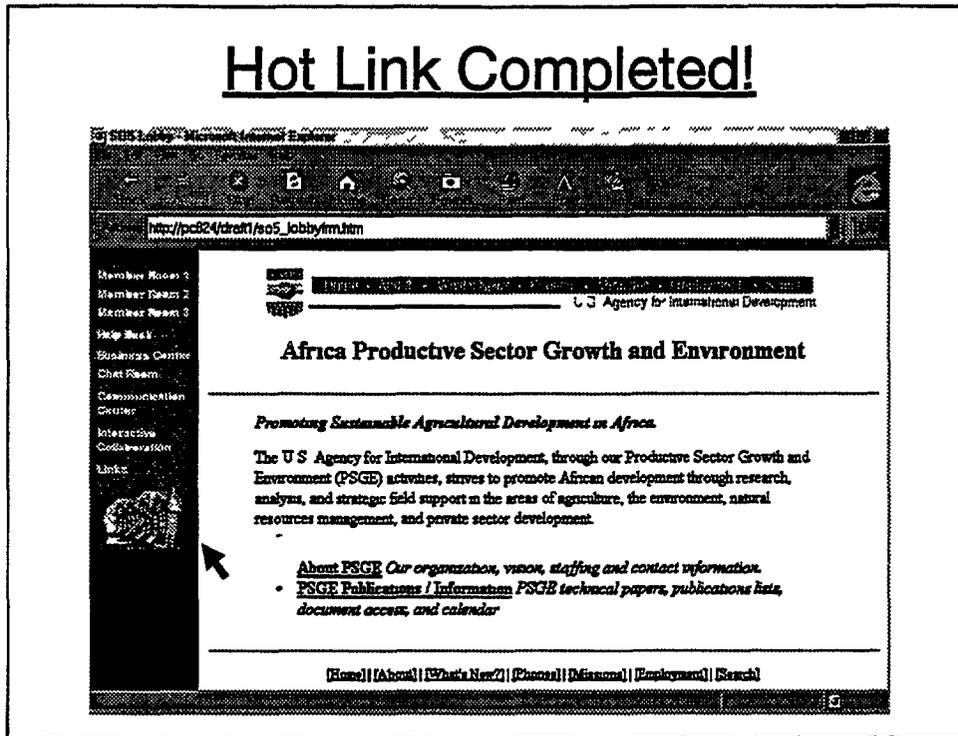
In this program, we are able to enter into a real-time discussion or collaborative work effort with another user who is also logged on at the web site. For example, several users could collaborate on making slides within a presentation application such as PowerPoint. They could also have access to a virtual white board for a brainstorming session. In both instances, the changes would be made and be visible to all parties at the same time, with the participants trading off control of the cursor, or mouse. Real-time audio connection using inexpensive microphones would enhance the collaborative aspect even further, as would a video link using small cameras mounted on the display unit. Most importantly, users could share access to a software program even if only one of those users possessed the program on their individual PC.

We now leave the Interactive Collaboration area by double-clicking on the Links hot link listed on the mini-site map to the left.

Hot Links Launch

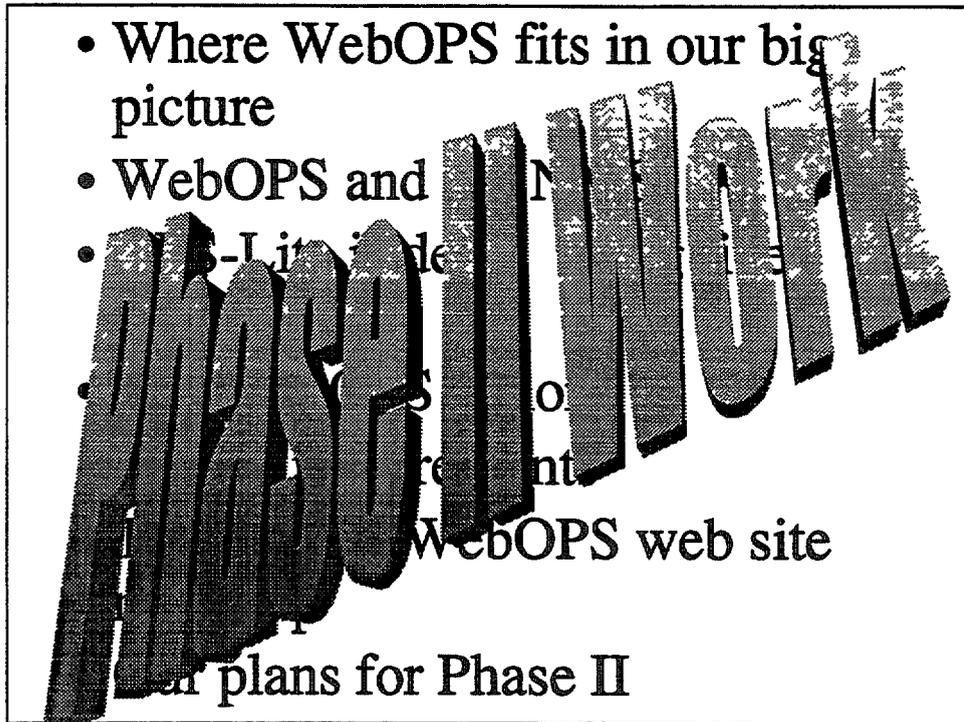


We have now entered the master list of Selected Links to Other Web Sites. By double-clicking on the hot link for “Productive Sector Growth and Environment (USAID/Africa Bureau), we immediately leave the SO5 home page and go to that USAID web site.

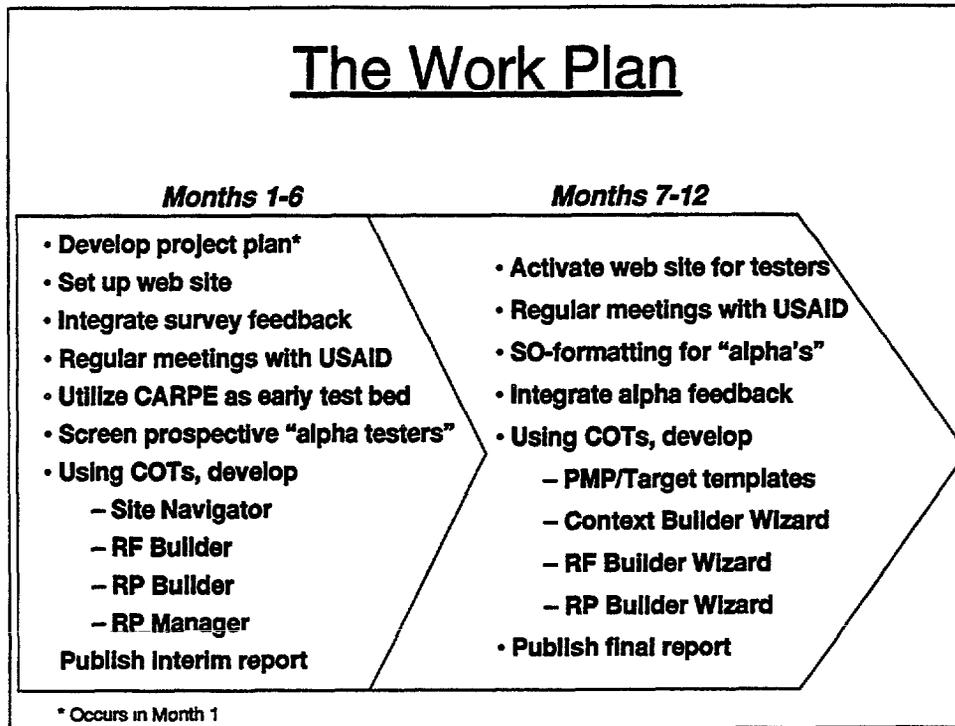


We are now at the official USAID web site, where we can access related documents and files

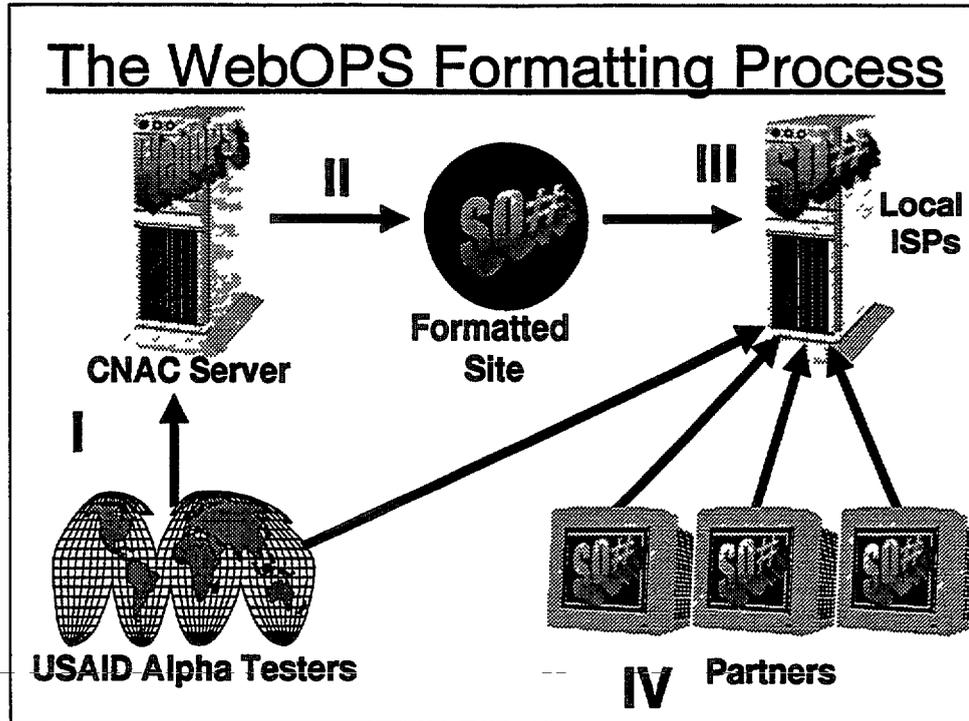
This concludes our screen-capture "tour" of the WebOPS web site mock-up



As a concluding section, we preview our plans for Phase II (software development) work on WebOPS



This slide presents our proposed work plan for the Phase II software development of WebOPS. Our basic strategy is to develop sufficient software in the first six months to activate the WebOPS home page for access by selected "alpha testers," who would then format copies of the WebOPS web site for their own use and testing with individual Strategic Objectives in the second half of Phase II. Using the feedback from these alpha testers, we would develop the wizards for the various applets in the second half of Phase II.



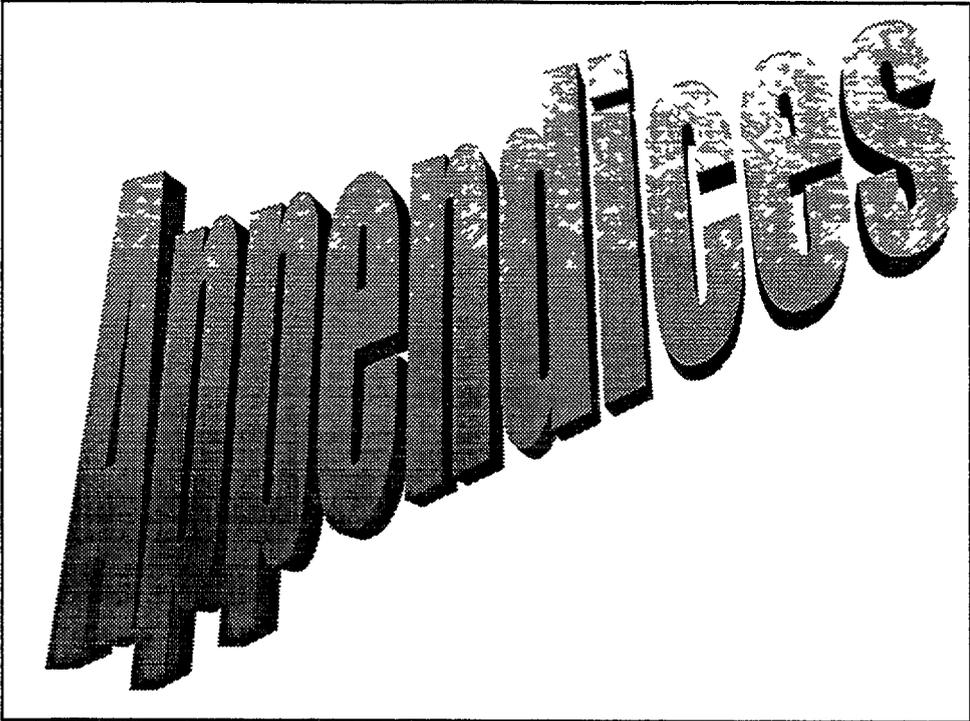
This slide presents our current approximation of the alpha-testing process in Phase II. Basically, USAID alpha testers would access the CNAC server upon which the WebOPS home page is housed. By formatting their own copy of the WebOPS webpage for their individual SO, the alpha-testing operating unit could either house their copy on the CNAC server if no ISP was available locally. Or, if an ISP was available (the more preferable solution), their formatted WebOPS web site could then be transferred to that local ISP for their maintenance and upkeep. Once the formatted SO web site was located at the local ISP, all USAID personnel involved with the SO, as well as any partners, could access the web site using a web browser over the Internet.



In conclusion, the CNAC study team believes that USAID should exploit the Internet for all it's worth, and should do so in ways that bolster the ambitious changes it undertook through reengineering over the past five years. WebOPS would do much to help realize USAID's original vision for the Expanded Strategic Objective Team by facilitating not just dialogue and interaction with development partners in the field, but by bringing them into the business of planning, achieving, and judging as much as possible. It will not be easy, but it is a challenge worth taking on.

Moreover, as the recent Stocktaking/Diagnostic survey demonstrated (draft "Stocktaking of Reforms Survey Analysis," by Larry Beyna, 1 May 1998, p 17), there seems to be a widespread opinion among USAID personnel that exploiting IT advances for improved communications has been a bright spot for the Agency's reengineering/reform efforts. As the report noted, "By far, staff give the highest marks—in fact, the highest rating on the entire survey to their ability to achieve results to Automation-Communication (i.e., E-mail, Internet, web)."

In short, the path seems clear.



Appendices A through E are presented in this annex to the annotated briefing

APPENDIX A

WebOPS Customer Survey for USAID staff and Expanded SOT Members

Communication technologies within Expanded SOTs

- What computer-based communications are you currently using (e g , E-mail, chat groups, listserver, newsletter)?
- What computer-based communications might improve interactions of Expanded SOTs?
- What are the major hardware limitations to communications among Expanded SOT members?
- What are the major software limitations?
- What other factors inhibit communication (of any kind) among Expanded SOT members?

Results Framework development and revision

- What graphics software do you currently use to develop Results Frameworks?
- What graphics capabilities would enhance your ability to develop Results Frameworks? Revise or update them?
- What word-processing features would help you better develop narrative descriptions of development hypotheses in Results Frameworks?
- What training would help make the development, testing, and revision of Results Frameworks more relevant to the daily activities of Expanded SOTs?

Strategic management activities

- What management tools do you currently use in managing Results Packages and their teams (e g , pert chart, calendar, results tracking)? Of those, which are computer-based?
- What electronic templates would be useful for sharing information obtained from monitoring activities?
- What search capabilities would help track information relevant for your Expanded SOT (i e , give examples of data you'd really like to get your hands on)?

- What hardware and software are you missing right now that you're fairly sure would increase your own efficiency or that of your expanded team?
- What publishing/Internet posting capabilities would help you in your management activities?

Monitoring and evaluation activities

- What electronic templates would help you in monitoring results?
- What templates would help you better share information with Expanded SOT members?
- Where in your decision-making processes do you feel most handicapped by insufficient information?

Hardware/software standards

We are building WebOPS to meet the following general standards for hardware and software

- Hardware IBM PC-compatible
- Operating system. Windows 95
- Browser Internet Explorer 4, Netscape 4
- Productivity suites Microsoft Office 97, Corel Suite 8
- Database manager undecided, Filemaker Pro is one candidate
- Charting undecided, Visio 5 is one candidate
- Groupware suite undecided, Microsoft Outlook is one candidate
- Interactive conferencing undecided, NetMeeting/Netshow is one candidate

Please comment as to the advisability of each standard

General issues, concerns, questions, comments

Please provide a list and/or discussion of any issues, concerns, questions, or comments that you might have about this proposed effort.

APPENDIX B

Connecting WebOPS to USAID's Real-World Problems

J Kathy Parker

(1) Where the information culture envisioned in the OPS BAA Report went wrong

Essay 1 explores how USAID sought to focus the envisioned OPS system on information technologies that would enhance its ability to learn about itself, its processes, and its performance, and to act upon new knowledge as the Agency obtained it. However, USAID has encountered a wide array of problems in implementing its vision. It began to require fundamentally different kinds of information from many of the same people who previously had responsibility primarily to track pipelines of money being expended. It required new information at a time when staff numbers were being cut. And it required a kind and level of data collection, analysis and reporting that overwhelmed many staff. WebOPS addresses some of these problems by providing mechanisms to (1) achieve a shared vision and strategic direction, (2) better prepare partners and customers to assume their role in USAID's information culture, and (3) develop means to come to grips with information so that it serves a learning organization rather than pushing a bureaucracy into a black hole.

(2) Helping address Internet end-user application issues encountered under the Leland Initiative in Africa

Essay II focuses on how to facilitate end-user access and use of the Internet as the Leland Initiative works "to bring the benefits of the global information revolution to people of Africa, through connection to the Internet and other Global Information Infrastructure (GII) technologies." WebOPS will be an Internet-based suite of software that provides both missions and development partners with sufficient capacity to achieve more collaborative online interactions at the Expanded SOT and RPT levels. WebOPS' Internet base will offer opportunities for sharing information, planning collaboratively, and managing adaptively within an "electronic work space." WebOPS cannot address some of the major barriers to Internet access and use. However it can address—to some degree—issues identified by the Leland Initiative, such as lack of awareness or understanding of the Internet and its potential use, as well as the lack of institutional communications and information strategies which the Internet supports.

(3) Tips to avoid falling into the “black hole” of information

Essay 3 focuses on information overload, a “terminal disease” for even the most efficient information manager. WebOPS will provide flexibility for operating units and partners to determine the kind and level of “connectedness” Expanded SOTs or RPTs want. They can then work toward building connections that meet those needs, selecting from the suite of software programs made available through WebOPS. WebOPS will provide a wide array of newsgroups, conferencing capabilities, hot links and access to databases. These will make communication easier and information more accessible. But, WebOPS will also provide search functions, message threading, indexes, and links between individuals to share specific information. And, it will provide opportunities for participants to interact with colleagues and other “experts” who can provide some of the filtering and quality control needed in this increasingly unbounded global information resource system.

(4) Impacts of global technologies and PC networking on team decision-making

Essay IV focuses on the challenge of new computer tools for communications and decision-making. Organizational communications literature suggests that changing the structure of communications changes the kinds and ways decisions are made, and it ultimately changes the organization itself. Many assumptions exist about how people use information in decision-making. For example, research suggests that—contrary to popular belief—people may not place a premium on the availability or quality of information. Also, there’s an assumption that information provided by sophisticated information management systems will be used extensively, but evidence suggests that this may not be the case. This kind of literature provides some important insights about the ways WebOPS tools may or may not be used in team decision-making. This essay also explores some of the ways that team decision-making—increasingly performed via computer-mediated communications—may affect USAID’s Expanded SOTs and RPTs. Among other things, changes in the quality and speed of decision-making by groups as compared to individuals are likely to be observed. Evidence suggests that groups are more likely to be able to discern and correct an error than an individual. However, the amount of time spent by a team making a decision is likely to be greater than by an individual.

(5) Developing norms for new roles and relationships via computer communications

Essay V focuses on some of the challenges of “herding mice”—the primary hand tool of the information age. Theory on human interactions, as well as on computer-mediated communication (i.e., those interactions facilitated by WebOPS), suggests that norms (i.e., written or unwritten rules) will affect the forms and usage patterns of computers for communication. People interacting in “virtual spaces” exhibit many characteristics of face-to-face communication: they argue, debate, reconcile, and offend. However, in a virtual world social identity is often changed, and people invent new ways of interacting that they might never exhibit in person. WebOPS cannot develop the norms for interactions, however, it can identify the need for new norms dealing with roles and relationships of the participants. These include development of mechanisms for coordinating information exchange, dealing with someone “grandstanding” or posting extremely long messages, defining group boundaries, ensuring that sanctions for inappropriate behavior are applied, and providing conflict resolution measures.

(6) Selected indicators and questions for monitoring WebOPS

Essay VI focuses on the need to look at a variety of indicators and to raise certain questions about WebOPS. A fundamental question is whether WebOPS improves the capacity and desire of Expanded SOT and RPT members to achieve a shared reality. An additional point to consider is the contribution WebOPS makes to the achievement of results. This may include the perception of its contribution in terms of the kind and magnitude of problems that arise as WebOPS tools are used. The effectiveness of WebOPS as a set of tools might be examined in terms of how well information exchanged is conveyed, how well substantive dialogue is facilitated, and whether there is evidence of diffusion of new ideas and methods of development assistance because of the introduction and application of WebOPS’ suite of software. The efficiency of WebOPS might also be looked at in terms of time in meetings versus cost of Internet communications versus other forms of communications and impact on decision-making time. WebOPS’ achievements might likewise be examined in terms of whether communication patterns are unidirectional or multidirectional, which tools facilitate collaboration best from the perspective of participants, and whether the strength of relationships increases or decreases because of computer interactions within virtual spaces (as compared to face-to-face).

APPENDIX C

Functional Specifications for WebOPS

- 1 Creating a Results Framework (RF)
 - 1 1 The user will assign a graphic symbol for a Strategic Objective (SO), an Intermediate Result (IR) where USAID is the principal donor, an IR where a development partner may be the primary supporter and USAID among those supporting it, and causal linkages
 - 1 2 The graphic will have a short name and an optional explanatory hypertext of up to 1500 characters
 - 1 2 1 An editable list of the short names will be maintained as categories of SOs, IRs and linkages, and will be presented to the user as a selection of choices
 - 1 2 2 The list of short names will be maintained
 - 1 3 An IR graphic will have a list of development partners of up to 20, distinguishing the partners by budgetary responsibilities
 - 1 3 1 An editable list of the partners will be maintained and presented to the user as a selection of choices
 - 1 3 2 The list of partners will be maintained in an address book database
 - 1 4 An IR graphic will have a timeframe (description of duration, giving start time and end time)
 - 1 5 An IR graphic will have an optional list of relevant documents of up to 20
 - 1 5 1 An editable list of the documents will be maintained and presented to the user as a selection of choices
 - 1 5 2 The list of documents will be maintained in a documents database
 - 1 6 An IR graphic will have an optional list of Core and Expanded SOT members of up to 20
 - 1 6 1 An editable list of the members will be maintained and presented to the user as a selection of choices
 - 1 6 2 The list of members will be maintained in an address book database

- 1 7 An IR graphic will have an optional list of indicators and/or performance measurement plans
 - 1 7 1 An editable list of the indicators and/or performance measurement plans will be maintained and presented to the user as a selection of choices
 - 1 7 2 The list of indicators and/or performance measurement plans will be maintained.
- 1 8 Users can use a default RF template or create their own The template will characterize the items in an RF by distinguishing its elements
- 1 9 The user can position the graphics on the work area.
- 1 10 The user can view the entire RF or its sections on one screen
- 1 11 The user can print the entire RF or its sections on one page
- 1 12 The RF will have one user assigned as the owner, with the date saved as a time stamp and the file distinguished as the original RF by assigning it the initial version number
- 1 13 There will be an option to start the Results Packager to partition the IRs into Results Packages (RPs) graphically by selecting the group of IRs and assigning it to an RP
- 2 Editing a Results Framework
 - 2 1 The user will be identified as the editor and the version number will be incremented when a user opens an existing RF for modification.
 - 2 2 An optional text will be requested by reason of changes
 - 2 3 The Results Packager will automatically be invoked if the RF is being partitioned into RPs
 - 2 4 The most recent version number of the RF will be opened for editing unless the user specifies a specific version number
 - 2.5 When a user edits a specific version that is not the latest version of the RF and the edited version is saved, the program will assign it a new version number to distinguish it from an existing version
 - 2 6 The user can identify a version as the release version This version will be used for the home page of that SOT if they desire to post their RF
- 3 Creating a Results Package
 - 3 1 The user can graphically partition the RF into groups of IRs There will be two views of the RPs One view reflects the RF and the RPs

graphic, another is a folder view to reflect containment. Creating a results package in either view will differ

- 3 2 An RP will have a short name and an optional descriptive hypertext of up to 1500 characters
 - 3 2 1 The list of RP short names will be maintained
- 3 3 An RP will have a list of development partners obtained from the lists of development partners for each IR in the package This list can be edited to reflect a different list.
 - 3 3 1 The list of the partners will be maintained and will be editable to delete partners, or to add any partners not listed for a particular IR but listed in an RP
 - 3 3 2 The list of partners will be maintained in an address book database
- 3 4 An RP will have a timeframe (description of duration, earliest start time and latest end time) obtained from the timeframes of the IRs The timeframe can be edited to reflect a different timeframe
- 3 5 An RP will have an optional list of relevant documents from the list of documents for a given IR. This list can be edited to reflect a different list.
 - 3 5 1 The list of the documents will be maintained and will be editable to delete partners, or to add any partners not listed for a particular IR but listed in an RP's list of documents
 - 3 5 2 The list of documents will be maintained in a documents database
- 3 6 An RP will have an optional list of Core and Expanded SOT members made up from the list of members in the IRs
 - 3 6 1 This list of the members will be maintained and will be editable to delete members, or to add any members not listed for a particular IR but listed in an RP's list of members
 - 3 6 2 The list of members will be maintained in an address book database
- 3 7 An RP will have an optional list of indicators and/or measurement plans made up by the indicators and/or measurement plans of the IRs
 - 3 7 1 The list of the indicators and/or performance measurement plans will be maintained and will be editable to delete any indicators or measurement plans, or to add any indicator or measurement plan not listed for any particular IR but listed in an RP's list of indicators

3 7 2 The list of indicators and/or measurement plans will be maintained.

4 Editing the Results Packages

- 4 1 The user will be identified as the editor and the version number will be incremented when a user opens an existing RP for modification
- 4 2 An optional text will be requested by reason of changes
- 4 3 The Results Packager will automatically open in the folder view, but the screen can be divided to provide both views
- 4 4 The most recent version number of the RPs will be opened for editing unless the user specifies a specific version number
- 4 5 When a user edits a specific version that is not the latest version of the RP and the edited version is saved, the program will assign it a new version number to distinguish it from an existing version
- 4 6 The user can identify a version as the release version This version will be used for the home page of that SO if they desire to post their RPs

5 The Results Package Manager

- 5 1 The RP Manager will maintain the lists of short names, partners, timeframes, documents, members, and indicators/measurement plans for the RF elements and RPs
- 5 2 The RP Manager will maintain the list of owners, editors, versions, reasons, and release versions of the RF and RPs
- 5 3 The RP Manager will manage the submission process for the published RF and RPs by maintaining the lists of members who can change the home page
- 5 4 The RP Manager will maintain the lists of members for the online private discussion groups

APPENDIX D

Selected WebOPS Links to Other web sites¹

African information technology and Internet resources

- The Abyssinia Cyberspace Gateway Your Community Resource on the Web [http //www cs indiana edu/hyp\[an\]/dmulholl/acg.html](http://www.cs.indiana.edu/hyp[an]/dmulholl/acg.html)
- Acacia Initiative (internet connectivity) [http //www idrc ca/acacia/acacia_e.htm](http://www.idrc.ca/acacia/acacia_e.htm)
- Africa Internet Forum [http://www undp org/sdnp/aif/policy.html](http://www.undp.org/sdnp/aif/policy.html)
- Africa Link [http //hawkeye info usaid gov/africalnk/](http://hawkeye.info.usaid.gov/africalnk/)
- African Connectivity Cost Comparison <http://demiurge.wn.apc.org/80/africa/afcosts.htm>
- African Data Dissemination Services [http //edcintl cr usgs.gov/adds/adds.html](http://edcintl.cr.usgs.gov/adds/adds.html)
- African E-mail Accessibility [http //www ee ic.ac.uk/misc/bymap/africa.html](http://www.ee.ic.ac.uk/misc/bymap/africa.html)
- African Information Society Initiative [http //www bellanet.org/partners/aisi](http://www.bellanet.org/partners/aisi)
- African Internet Connectivity [http //demiurge wn apc org 80/africa/](http://demiurge.wn.apc.org/80/africa/)
- African Internet Development Action Team (promotes Internet development) <http://www.africa.com/pages/aidat> [not active]
- African Universities Online (with Internet access and home page on WWW) [http //www aaas org/international/ssa/afonline.htm](http://www.aaas.org/international/ssa/afonline.htm)
- Amex International (telecommunications company in Africa) [http //www amexdc.com](http://www.amexdc.com)
- Decisions Support Systems Research Resources <http://dss.cba.uni.edu/DSShome.html>
- Federal Communications Commission [http //www fcc gov/](http://www.fcc.gov/)
- Global Information Infrastructure (GII) Initiative [http //www ntia.doc gov/oi/home/gii.html](http://www.ntia.doc.gov/oi/home/gii.html)
- Global Telecommunications Society [http //embassy org/gts/](http://embassy.org/gts/)
- Greater Horn Information Exchange [http //www info usaid gov/HORN/](http://www.info.usaid.gov/HORN/)
- Institute of Electrical and Electronics Engineers, Inc (telecommunications work in Africa) [http //www.ieee.org/](http://www.ieee.org/)

Note the reader should interpret all spaces in URLs as the “underscore” key

- International Telecommunication Union <http://www.itu.ch/>
- Internet Resource Guides Selected Sites with Special Reference to Africa <http://www.info.usaid.gov/regions/afr/abic/guides.htm>
- Leland Initiative <http://www.info.usaid.gov/regions/afr/leland>
- Mbendi Information for Africa Computer and Communications Companies of Africa <http://www.mbendi.co.za/>
- National Telecommunications and Information Administration <http://www.ntia.doc.gov/>
- National Telephone Cooperative Association <http://www.ntca.org/>
- OECD Information and Communications Policy <http://www.oecd.org/dsti/sti/it/index.htm>
- The Online Intelligence Project—Africa <http://kahn.interaccess.com/intelweb/africa.html>
- Regional Telecommunications Restructuring Program <http://www.info.usaid.gov/regions/afr/rtr/>
- PC World East Africa <http://www.africaonline.co.ke/AfricaOnline/pcworld.html>
- SatELife (international nonprofit using Internet technology to serve health communication and information needs) <http://www.healthnet.org>
- Telecom Links for the Southern Africa Regional Telecommunications (RTR) Telecom Program <http://rtr.worldweb.net/links.htm>
- Telecommunications Industry Association <http://www.industry.net/associations/tradeorg/tia.htm>
- User's Guide to Electronic Networks in Africa (index by country) <http://www.aaas.org/international/africa-guide/index.html>

Information technology and communications, general

- Free IT Performance Measurement Guide <http://www.npr.gov/library/announc/freet.html>
- Global Knowledge 97 Conference sponsored by the World Bank <http://www.globalknowledge.org/>

USAID general sites

- Automated Directives System (ADS)
http://www.info.usaid.gov/ftp_data/pub/handbooks/
- Congressional Presentation (FY 98)
<http://www.info.usaid.gov/pubs/cp98/afr/>
- Development Experience System USAID's Institutional Memory
<http://www.dec.org/search/dexs/docs-1987-present/> [NOTE queries can be made in the databases accessed at site]
- New Partnerships Initiatives (NPI) Resource Guide
<http://www.info.usaid.gov/pubs/npi/npiresrc.htm>
- Results-Oriented Assistance A USAID Sourcebook
<http://207.175.11.14/usgov/>
- USAID Home Page <http://www.info.usaid.gov/>
- USAID's Development Clearinghouse <http://www.dec.org/>
- USAID Publications <http://www.info.usaid.gov/pubs/>

Africa Bureau sites

- Africa Bureau Information Center (ABIC)
<http://www.info.usaid.gov/regions/afr/abic>
- Africa Data Dissemination Services (ADDS)
<http://edcsnw4.cr.usgs.gov/adds/adds.html>
- Productive Sector Growth and the Environment Publications
<http://www.info.usaid.gov/sdpsge/pubs/pubs.html>
- SD Datacenter <http://209.135.238.67/>

USAID Africa region environment and natural resource management sites

- Agriculture and Forestry Sites
<http://www.info.usaid.gov/regions/afr/abic/agsites.htm>
- Central African Regional Program for the Environment (CARPE)
<http://carpe.gecp.virginia.edu>
- Environment on the World Wide Web
<http://www.info.usaid.gov/regions/afr/abic/envsites.htm>
- NRM Analytic Framework
<http://www.info.usaid.gov/regions/afr/sdpsge/nrm/analfram/analfrm.html>
- Productive Sector Growth and Environment (USAID/Africa Bureau)
<http://www.info.usaid.gov/regions/afr/sdpsge>

- Results Oriented Natural Resources Management Activity (RESON)
<http://209.135.238.67/RESON/reson.htm>
- SD Datacenter <http://209.135.238.67/>

Environment and natural resources management sites, general

- Australia's Environmental Information Sources on the Internet
http://www.environment.gov.au/other_servers/other_servers.html
- Biodiversity and Conservation Hypertext Book by Peter J Bryant
<http://darwin.bio.ucl.edu/~sustain/bio65/T1t1page.htm>
- Central African Regional Program for the Environment (CARPE) Bibliography (HTML) <http://carpe.gecp.virginia.edu/product/biblio.htm>
- Central African Regional Program for the Environment (CARPE) Central African GIS Dataset http://carpe.gecp.virginia.edu/partners/gsf-umd/UMD/p4_gis.html
- Employment Opportunities, forestry
http://ourworld.compuserve.com/home_pages/eworks/FOREST.HTM
- ENRIC Searchable Tropical Forest and Conservation Bibliography
gopher://minerva.forestry.umn.edu.70/11/trps
- The EnviroWeb A Project of the EnviroLink Network
<http://www.envirolink.org/index1.html>
- European Tropical Forest Research Network <http://www.etfrn.org/>
- FAO State of the World's Forests (SOFO)
<http://www.fao.org/waicent/faoinfo/forestry/SOFOTOC.htm>
- Famine Early Warning System (FEWS)
<http://www.info.usaid.gov/regions/afr/fews>
- Forest Frontiers Initiative <http://www.wri.org/wri/ffi/>
- International Center for Research in Agroforestry (ICRAF)
<http://www.cgiar.org/icraf/>
- Land Quality Indicators Program <http://www-esd.worldbank.org/lqi/home.htm>
- One World Magazine <http://www.envirolink.org/oneworld/index.html>
- Rainforest Action Network <http://www.ran.org/ran/>
- Regional Environmental Information Management Project (REIMP)
<http://www-esd.worldbank.org/reimp/>
- Remote Sensing Imagery for Natural Resources Monitoring A Guide for First-Time Users <http://bandersnatch.fnr.umass.edu/pub/rs.html>

- Sustainable Business Network <http://www.envirolink.org/sbn/>
- Trees Project (Tropical Ecosystem Environmental Observation by Satellite) <http://www.mtv.sai.jrc.it/projects/treeswww/trees2.html>
- Trees for the Future <http://www.treesfff.org/>
- World Conservation Monitoring Center (with databases) <http://www.wcmc.org.uk/>
- WWW Virtual Library Forestry <http://www.metla.fi/info/vlib/Forestry/>

Environment and natural resources management organizations

- Center for International Forestry Research <http://www.cgiar.org/cifor/>
- CIRAD (research institute in France) <http://www.agropolis.fr/rcirad.html>
- Cultural Survival <http://www.cs.org/general.htm>
- Earth Resources Observation Systems (EROS) Data Center DAAC (EDC DAAC) <http://edcwww.cr.usgs.gov>
- Environmental Organizations Webdirectory Forestry <http://www.webdirectory.com/Science/Agriculture/Forestry/>
- International Institute for Sustainable Development <http://iisd1.iisd.ca/>
- Internet Directory for Botany <http://www.helsinki.fi/kmus/botmenu.html>
- IUCN World Conservation Union <http://www.iucn.org>
- International Union of Forestry Research Organizations (IUFRO) <http://iufro.boku.ac.at/>
- Natural Resources Research Information Pages—Institutions and Organizations <http://sfbox.vt.edu/10021/Y/yfleung/forestry.html>
- Nature Conservancy <http://www.natureconservancy.org/>
- Sierra Club <http://www.sierraclub.org/>
- TROPENBOS Foundation <http://www.tropenbos.nl/>
- World Environment Center <http://www.wec.org/>
- World Resources Institute <http://www.wri.org/>
- Worldwatch Institute <http://www.worldwatch.org/>
- World Wildlife Fund <http://www.wwf.org>

Agricultural organizations and agriculture sites with information related to Africa

- Agribusiness, Food Industry and Forest Industry Associations on the Internet <http://www.nal.usda.gov/atmic/pubs/agriassn.htm>
- Agricultural Market Information Virtual Library <http://www.aec.msu.edu/agecon/fs2/market/contents.htm>
- Agricultural Research and Extension Network (AgREN) <http://www.oneworld.org/odi/agren/index.html>
- Agricultural Statistic Information Links (ASIL) <http://www.fao.org/waicent/faoinfo/economic/statisti/links/new.htm>
- Agriculture Network Information Center (AgNIC) <http://www.agnic.org/>
- Agriculture Online <http://www.agriculture.com/>
- AgCAL (AgNIC Calendar of Meetings, etc) <http://www.agnic.org/mtg/>
- AgExp (AgNIC Experts List) <http://www.agnic.org/experts/>
- AgriGator http://gnv.ifas.ufl.edu/www/agator_home.htm
- AgNIC Database Directory (of agriculture-related databases, datasets, and information systems) <http://www.agnic.org/agdb/>
- Agricola CC (Agricola Subject Category Codes) <http://www.agnic.org/cc/>
- Agrilink—South Africa's Virtual Trading and Information Centre <http://www.agrilink.co.za/>
- Agrisurf (searchable index) <http://www.agrisurf.com/agrisurfscripts/agrisurf.asp?index= 25>
- Alternative Farming Systems Information Center (AFSIC) <http://www.nal.usda.gov/afsic/>
- CAB International (biological pest management, etc) <http://www.cabi.org/>
- Consultative Group on International Agricultural Research (CGIAR) <http://www.cgiar.org/>
- Directories of Agriculture-Related Internet Information Resources <http://www.agnic.org/diragis/>
- Entomology Index of Internet Resources via Iowa State <http://www.ent.iastate.edu/List/>
- FAO's Food Supply Situation and Crop Prospects in Sub-Saharan Africa <http://www.fao.org/WAICENT/FAOINFO/ECONOMIC/gIEWS/english/eaf/eaftoc.htm>
- FruitNet—South Africa Market Prices for Fruit <http://www.fruitnet.co.za>

- GENRES—Information System on Genetic Resources
<http://www.danet.de/genres/genres-e.htm>
- Global Information and Early Warning System on Food and Agriculture (GIEWS) <http://www.fao.org/WAICENT/FAOINFO/ECONOMIC/giews/english/giews.htm>
- International Food Policy Research Institute (IFPRI)
<http://www.cgiar.org/ifpri/>
- International Institute of Tropical Agriculture (includes list of NARS—National Agricultural Research Systems in Sub-Saharan Africa)
<http://www.cgiar.org/ita/>
- Links to Internet Resources Agribusiness and Business Research
<http://kierkegaard.fas.ufl.edu/tm/courses/aeb4325/busres.htm>
- Smallholder Agriculture in Africa <http://www-smallholder.entom.slu.se/>
- Special Program for African Agricultural Research (SPAAR)
<http://www.worldbank.org/html/aftsr/>
- Statistical Resources on the Web Agriculture
<http://www.lib.umich.edu/libhome/Documents/center/stag.html>
- Sustainable Agriculture, Virtual Library
<http://www.floridaplants.com/sustainable.htm>
- World Wide Web Agricultural Perspectives
<http://www/wdc/net/~smd/agcult.htm>

Other development organizations

- African Development Foundation
<http://www.citation.com/hpage2/adfon2.html>
- Canadian International Development Agency (CIDA) Virtual Library on International Development <http://w3.acdi-cida.gc.ca/Virtual.nsf/pages/index.htm>
- European Union <http://europa.eu.int/>
- Food and Agriculture Organization (FAO) of the United Nations
<http://www.fao.org>
- International Development Research Centre (IDRC) <http://www.idrc.ca/>
- International Monetary Fund (IMF) <http://www.imf.org>
- IMF Directory of Economic Commodity and Development Organizations
<http://www.imf.org/external/np/sec/decdo/contents.htm>
- OECD/Development Assistance Committee Home Page
<http://www.oecd.org/dac/index.htm>

- Overseas Development Administration (ODA)
<http://www.oneworld.org/oda>
- Overseas Development Institute (ODI) <http://www.oneworld.org/odi/>
- Relief Web Home Page <http://www.notesreliefweb.int/>
- SIDA (Swedish International Development Cooperative Agency)
<http://www.sida.se/>
- SIDA Info Centre <http://www.sida.se/eng/infotek/infoteket3.html>
- SIDA Evaluations <http://www.sida.se/eng/infotek/eval/evaluation.html>
- Sustainable Development Providers, Directory
<http://www.ecouncil.ac.cr/about/SDIP/sustdef.htm>
- United Nations Home Page <http://www.un.org/>
- United Nations Development Programme <http://www.undp.org/>
- United Nations Environment Programme <http://www.unep.org/>
- The World Bank Group Topics in Development
<http://www.worldbank.org/html/extdr/thematic.htm>
- World Bank Rural Development Department <http://www-esd.worldbank.org/html/esd/agr/agrmain.htm>

Africa information, general

- American Association for the Advancement of Science, Sub-Saharan Africa Program <http://www.aaas.org/international/ssa/ssa.htm>
- Balance Sheet of Human Progress in Africa (e.g., life expectancy, child mortality, health, education, income)
<http://www.unicef.org/miscellaneous/balance.htm>
- Directory of Internet Resources on Africa and African History
<http://www.academicinfo.net/histafrica.html>
- Health and Human Resources Analysis for Africa
<http://www.info.usaid.gov/regions/afr/hhrraa/>
- Home Pages, Complete Listing of Every African Country's Home Page
http://www.sas.upenn.edu/African_Studies/Home_Page/Country.html
- Miscellaneous African Dishes/Recipes/Restaurants
http://www.sas.upenn.edu/African_Studies/Miscellany/menu_Miscellany.html
- PRIDE Africa (business program)
<http://members.tripod.com/~PrideAfrica>

- Resources on Complete History of Africa dated back to 500 B C
<http://www.cup.org/Titles/AFRICA.html>
- United Nations Databases <http://www.un.org/databases/>
- U S Merchandise Trade with Sub-Saharan Africa (AFR)
http://www.info.usaid.gov/economic_growth/trdweb/subsah.htm

African organizations, selected

- The Foundation for Research Development (South Africa)
<http://apies.frd.ac.za/frd/frdintro.html>
- African Centre of Technology Studies—An Institute for Policy Research and Training for Sustainable Development in Africa
<http://www.anaserve.com/~acts/>
- International Political Economy Network
<http://csf.colorado.edu/ipe/africa.html>
- Organization of African Unity http://www-nunuc.uchicago.edu/munuc/REG_Committees/OAU.html
- Southern Africa Political and Economic Series Trust (SAPES)
<http://csf.colorado.edu/ipe/sapem/sapem.html>

News online from and about Africa

- Addis Tribune Online <http://AddisTribune.EthiopiaOnline.Net/>
- Africa News http://www.peacelink.it/an_curr.html
- Africa Online List of Newspapers Online and Links
<http://www2.ncsu.edu/ncsu/arm/NEWSPA.HTML>
- Africa Online <http://www.africaonline.com/AfricaOnline/covernews.html>
- Africa News Online <http://www.africanews.org>
- Africa Recovery (Online) <http://www.un.org/ecosocdev/geninfo/afrec/>
- African Communist (Online) <http://www.sacp.org.za/ac/>
- African Libraries newsletter (ALN) <http://www.lib.msu.edu/lauer/aln/>
- Afrique Tribune (Online) <http://www.pagel.com/afriquetribune/>
- BBC News—Africa
<http://news.bbc.co.uk/1/1/english/world/africa/default.htm>
- Constitution News (ANC) http://www.anc.org.za/80/lists/anc_pubs.html
- Daily Nation (Nairobi) <http://www.africaonline.co.ke/nation/>

- Die Burger (Online) Capetown
<http://www.naspers.co.za/dieburger/english/>
- East African <http://www.africaonline.co.ke/eastafrican/980409/index.htm>
- EcoNews Africa <http://www.web.net/~econews/index.html>
- Electronic Mail and Guardian (South Africa) <http://www.mg.co.za/mg/>
- L'Express (Online) Mauritius <http://www.lexpress-net.com/>
- The Express (Tanzania) <http://www.intafrica.com/80/express/>
- FLASH Newsletter of the Network for Environment and Sustainable Development in Africa <http://rri.org/80/nesda/flash.html>
- Fraternite Matin Online (Ivory Coast)
<http://www.africaonline.co.ci/AfricaOnline/infos/fratmat/fratmat.html>
- Ghana Review International <http://www.ghanareview.co.uk/>
- Ghanaian, The Chronicle Online
http://www.ghana.africaonline.com/AfricaOnline/newsstand/chronicle/1/home_page.html
- Horn of Africa Bulletin
http://www.sas.upenn.edu/African_Studies/Newsletters/menu_HAF_Main.html
- International Peacekeeping News
<http://csf.colorado.edu/dfax/ipn/index.htm>
- Internet WorldWide Namibia <http://www.iwwn.com.na/>
- Ivoir'Soir (Ivory Coast)
<http://www.africaonline.co.ci/AfricaOnline/infos/ivs/ivs.html>
- Le Jour Online (Ivory Coast)
<http://www.africaonline.co.ci/AfricaOnline/infos/lejour/lejour.html>
- Washington Post—Africa <http://www.washingtonpost.com/wp-srv/matl/africa.htm>
- US/Africa Online Newspaper and Money Watch
<http://www.usafricaonline.com/>
- Zambia Daily Mail Online
<http://www.zamnet.zm/zamnet/zadama/zadama.html>

Africa business and finance news

- Africa Online Business News
<http://www.africaonline.com/AfricaOnline/coverbusiness.html>
- Africa Stock Exchange Guide <http://africa.com/pages/jse/page1.htm>
- Economic and Development Bulletin
<http://www.africanews.org/PANA/economics/>
- Economic Review (Nairobi)
<http://www.africaonline.co.ke/AfricaOnline/ereview.html>
- Financial Mail Interactive <http://www.fm.co.za/>
- South Africa's Bureau of Financial Analysis Network
<http://www.bfanet.com/>
- WoYaa! Internet Magazine Africa
<http://www.woyaa.com/TreeFR/Business/Economy/>

African music

- Africa Online Music
<http://www.africaonline.com/AfricaOnline/covermusic.html>
- Music Chat/Music Forum
<http://www.africaonline.com/AfricaOnline/cgi/chat.cgi?Music>

African sports news

- Africa Online Sports
<http://www.africaonline.com/AfricaOnline/coverSports.html>
- Cricket Fund 2000 <http://www.lanka.net/cricket/crik2000.html>
- The Daily Soccer <http://reuters.dailysoccer.com/cgi-bin/nph-search.cgi?what=text>
- PanAfrican News Agency Sports News
<http://www.africanews.org/PANA/sports/>
- 110 Minutes with Hakeem Olajuwon (basketball player)
[Http://www.usafricaonline.com/olajuwon.html](http://www.usafricaonline.com/olajuwon.html)
- Zambia Daily Mail Sports
<http://www.zamnet.zm/zamnet/zadama/zadama.html>

African studies journals and programs

- African Collection <http://www.uflib.ufl.edu/80/hss/africana/>
- African Studies on the Internet—Columbia University
<http://www.columbia.edu/cu/libraries/indiv/area/Africa/>
- African Studies Quarterly The Online Journal of African Studies
<http://web.africa.ufl.edu/asq/>
- African Technology Forum (science and technology)
<http://web.mit.edu/africantech/www/>
- Cho en Afrique L'Histoire Africaine en Langue Francaise
<http://www.up.univ-mrs.fr/~wclio-af/>
- Electronic Newsletter of African Studies
http://www.sas.upenn.edu/African_Studies/ASA/enas.html

African travel

- Africa Online Travel
<http://www.africaonline.com/AfricaOnline/covertravel.html>
- Index of Tour Operators
<http://www.africanet.com/africanet/tourops/safcons1/>

African women/gender issues

- Africa Online Women
<http://www.africaonline.com/AfricaOnline/coverwomen.html>
- African Center for Women
<http://www.un.org/Depts/eca/divis/acw/index.htm>
- African Women Global Network <http://www.osu.edu/org/awognet/>
- IFPRI Gender Research Network
<http://www.cgiar.org/ifpri/gender/gender.htm>
- Women in Development Network (WIDNET)
<http://www.focusintl.com/widnet.htm>
- Women of Africa Resources <http://www.lawrence.edu/~bradleyc/war.html>
- World Women in Development and Environment (WorldWIDE Network, Inc) <http://www.zzoom.com>

News, sports, business, etc., U.S. and international

- BBC News—Business <http://news.bbc.co.uk/1/english/business/default.htm>
- CNN Financial News <http://cnfn.com/>
- CNN & Sports Illustrated <http://www.cnns1.com/>
- Blackwell's Information Services <http://www.blackwells.com/>
- Dun & Bradstreet Internet Access <http://www.dnb.com>
- ESPNET Sportzone <http://espnet.sportzone.com>
- Federation Internationale de Football Association (Zurich) <http://www.fifa.com/index.html>
- Financial Times <http://www.ft.com/>
- FinWeb Financial Links <http://www.finweb.com/>
- Global Financial Data <http://www.globalfindata.com/>
- Globe Online <http://www.globeonline.fr/default.asp>
- International Newspapers <http://www.professional.net/inter-newspapers.htm>
- Le Monde <http://www.lemonde.fr>
- Le Monde Diplomatique <http://www.monde-diplomatique.fr/md/index.html>
- The London Times and the Sunday Times <http://www.the-times.co.uk/>
- Miscellaneous Resources on Electronic Newspapers <http://www.mediamfo.com/ephome/research/researchhtm/misc.htm>
- The New York Times on the Web <http://www.nytimes.com>
- Washington Post—Sports <http://search.washingtonpost.com/wp-srv/sports/front.htm>
- Wired News (IT news) <http://www.wired.com/news/>

Reengineering in other federal government agencies

- Reinventing Government Home Page <http://www.npr.gov/>
- Office of Reinvention, Environmental Protection Agency <http://www.epa.gov/remvent/>
- Business Practices Office of USDA Animal and Plant Health Inspection Service <http://www.aphis.usda.gov/mb/bpt>

Of general interest to somebody, somewhere

- Amazon.com <http://www.amazon.com/>
- Central Intelligence Agency <http://www.odci.gov/cia/>
- Dilbert Zone <http://www.dilbert.com/>
- The Funny Farm <http://www.ifas.ufl.edu/7100/www/agator/htm/fun.htm>
- Bill's Lepidoptera Photos (most recent ones from Kenya's Masai Mara National Park) <http://www.med.virginia.edu/~wth2m/menu.html>
- Trendy Magic Interactive
<http://pw2.netcom.com/~sleight/interactivemagic.html>
- Postcards from Texas Trading Post
http://www.TravelTex.com/FS_TradingPost.html
- Virtual Flower Bouquet <http://www.virtualflorist.com/index.htm>
- White House Guest List
http://www.motherjones.com/news_wire/WHguests_intro.html

APPENDIX E

Capacity Planning for WebOPS

Introduction

Three issues are central to capacity planning

- the levels of service you expect to provide a user
- the applications and contents you require to meet the purpose of the site
- the hardware and software systems that the applications are to run

Hardware and software systems

The following discussion focuses on the last issue. The information presented here are only general guidelines. Specific cases would need additional information and study.

Several capacity planning tools are available in the market. BGS, Optimal Networks, Make SYstems, NetSys Technologies, Eshbel Technologies, and Benchmark Factory are some of the vendors with market offerings. There are online resources and excellent articles (as well as books) that attempt to deal with this issue (see the brief list of sources at the end of this appendix).

A number of factors define the bandwidth requirements for WebOPS (for example, the number of simultaneous users). WebOPS' content is another—the more graphically oriented the content, the higher the bandwidth requirements. Another factor is the amount of traffic—a large amount will increase bandwidth requirements.

Intel architecture using NT

The choice of operating system can influence the hardware (or vice versa). For instance, Unix and NT will run on several server architectures. The following estimates are based on an Intel architecture using NT.

<u>Service</u>	<u>0-5 Users</u>	<u>5-20 Users</u>	<u>20-100 Users</u>
WWW	486/33 32 MB RAM 1 GB HD	486/100 32 MB RAM 1 GB HD	Pentium/166 64 MB RAM 2 GB HD
FTP	486/33 32 MB RAM 1 GB HD	486/100 32 MB RAM 1 GB HD	Pentium/166 64 MB RAM 2 GB HD
E-mail	486/100 48 MB RAM 1 GB HD	486/100 48 MB RAM 1 GB HD	Pentium/166 64 MB RAM 2 GB HD
All three	486/100 64 MB RAM 2 GB HD	486/100 64 MB RAM 2 GB HD	Pentium/166 64+ MB RAM 2 GB HD

Traffic by application types

The following table contains some details about the traffic that can be generated by application types

<u>Service</u>	<u>Application</u>	<u>Traffic</u>
Continuous info flow	Push channels	Application dependent
Multimedia	Video, Audio	28 kbps - 1.3 MBps per user session
WWW	Intranet/Internet	50-100 kb/hit
FTP	Intranet/Internet	Content dependent
E-mail	Intranet/Internet	10-50 kb/session

Types of connection to Internet

The following table gives the types of connection to the Internet

<u>Type</u>	<u>Cost</u>	<u>Speed</u>
Modem	\$	Up to 56 6 Kbps
ISDN	\$\$	Up to 128 Kbps
Frame Relay	\$\$\$	Up to 1 5 Mbps
T1	\$\$\$	Up to 1 5 Mbps

NOTE The first two are modem types and the other two are permanent communication links
The CNAC study team is aware of other Internet connectivity options (T2, T3, T4, SMDS, ATM, satellites), but we do not envision such large capacity throughput at this time

Bandwidth needs per user

The following table illustrates bandwidth needs per user

<u>Services</u>	<u>0-5 users</u>	<u>5-20 users</u>	<u>20-100 users</u>
WWW	56 Kbps	56 Kbps or ISDN	T1 leased line
FTP	56 Kbps	56 Kbps or ISDN	T1 leased line
E-mail	28.8 Kbps	56 Kbps or ISDN	56 Kbps/frame relay
All of above	56 Kbps	56 Kbps or ISDN	T1 leased line

The security and fault tolerance aspects have deliberately been omitted from this discussion. Both aspects are additive and increase the need for hardware resources.

Sources

- www.capacityplanning.com
- The Institute for Computer Capacity Management (ICCM)
- CAPE (Capacity and Performance Engineering)
- Capacity Planning and Performance Modeling; Menasce, Almeida and Dowdy (Prentice Hall, 1994)
- Capacity Planning for Computer Systems, Browning (AP Professional, 1994)
- Fulfilling Customer Needs A Practical Guide to Capacity Management; Jackson and Frigon (John Wiley & Sons, 1998)