

*“A Day in the Life....”*

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The following illustrates the potential workflow/procedure(s) and efficiencies assuming the proposed directions are implemented. It follows the day of an executive in Washington, DC, a fisheries biologist in a remote site - Willard, WA, a fish and wildlife director in Portland, OR, their respective administrative staffing, a grade school class in Atlanta Georgia, a grad student in Columbus Ohio, and a Council staffer in Lewiston, Idaho. This scenario, a composite - illustrates how they potentially currently interact and how the application of currently realizable technology could streamline their workflow process. By currently realizable technology, I refer to what is actually possible with certain shifts in our analysis of procedure and the leveraging of technologies/methodologies that have been overlooked for the most part in our present corporate environment for unknown reasons. While these scenarios are focused in a Fish and Wildlife arena, the technology could just as easily be applied in a slightly varied fashion to any other arena. All it requires is a global perspective.

Text in blue describes processes that can be applied with minimal investment in complimentary technology that has been researched and developed over the past five years by my workgroup, but not currently implemented. Text in red describes processes that could be applied with serious commitment to implementation, direction and technology that has been researched and developed over the past five years by my workgroup. Of note, all these technologies will require significant rethinking/commitment of the way non-IT professionals conduct their business.” You can bring a horse to water, but....”

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- 6:00 AM, Washington, DC suburbs - Eastern Standard Time

Upon rising for breakfast after a good nights sleep, the liaison from the DC office sits down and securely (via a secure shell layer) logs into the regional office LAN in his makeshift home office in the DC suburbs to his computer (Laptop - Pentium 100 with Windows 95, External Monitor, 32 MB RAM), seamlessly connecting via a 256k DSL line connected to the ATM ring around the city which is connected to an ISP which forwards the connection via T1 to the home office LAN. This creates a virtual private network that cannot be tapped. At this point the executive is connected via an IMAP compliant mail client to the Internet Mail Server and directly reads his new mail in place via the client at a performance rate between 256k and 1.5 mbps (dependent on price/performance comfort....). Upon reading his new email, he discovers that he needs to:

- Prepare for a debriefing meeting at the white house on the current status of a sturgeon rearing program in Willard, WA to happen in two days.
- Respond to a request from the director of Fish and Wildlife with regard to implementation of policy before a presentation meeting scheduled at 9:00 am pacific standard time.
- Read and possibly respond to a PDF formatted document posted on another agency's web site that outlines proposed draft ESA listings accessed via a hypertext link to the URL embedded within the email message.
- Print out a copy of the schedule of appointments for the day.

He first responds to the email regarding the RFI from the Division Director - relatively little work - just agreeing to some of the proposal and clarifying points in some other parts. He then emails his reply, confident that it will be immediately available to the division director when he rises from bed on the west coast. Additionally, he archives the reply with the full-text of the division director's letter to his personal full-text data archive on the server and erases the original email message. Upon the addition of the new email message to the personal archive server, the computer it resides on begins an immediate rebuild of the archive database making the email message available for query within the following 15 minutes to half an hour and to be backed up in the following automatic system backups occurring the in the evening in Portland.

Second, he opens the internet based ICAL server, to verify that the White House meeting has been scheduled and to look for conflicts with existing appointments. Upon opening his calendar, he finds that there is a teleconference with the governor of Washington scheduled at the same time as the White House meeting. He queries

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the ICAL system, which connects to the governor's ICAL system via LDAP, and asks for the next possible date/time that the teleconference could take place. The computer returns a comparison of the available times for the governor against the executives schedule. The executive selects a good time, commits the scheduling to both his and the governor's calendar, and emails both his executive assistant and the governors to let them know of the change, why it occurred and to possibly renegotiate if the schedule is not acceptable to either parties. He then erases the entry for the governor that is scheduled for the same time as the White House meeting.

Third, he connects via the URL to the website document proposing draft ESA listings via the hypertext link embedded within the email message - once again using RSA encryption and a secure shell layer to pass through the agency firewall to access the sensitive data. Validation of his access occurs automatically and seamlessly via standard non-vendor specific protocols by the servers at both ends. The executive reads the document, but decides to defer comment until after thinking about the proposal for a while.

Finally, he prints out a paper copy of his schedule for the day to carry along with him in his adventures. He discovers that the first meeting that he has scheduled for the day is occurring on the other side of town from his office, and decides to go directly there - rather than going to the office first. He emails his assistant to make her aware of his current itinerary.

- 6:30 AM, Washington, DC - Eastern Standard Time

The executive eats breakfast and readys himself for work...

- 7:15 AM, Washington, DC suburbs - Eastern Standard Time

Sitting down once again at the computer, unlocking the automatic screen lock via the password mechanism, the executive finds himself still connected to the Home Office LAN. The cost for this is a fixed fee with his ISP in DC and he is not being charged for minutes. He moves via web browser to the GIS request WebSite and enters a request into the mapping request form for a map showing all known sturgeon research sites color coded to indicate ownership and hypertext linked to any available scientific and financial data related to the project selected. The GIS computers then automatically create the map as per the instructions, post the map to a web URL, pass the hypertext reference points to another survey that then queries the websites for each of the projects listed, looking for financial data and supporting data about each project - building supplemental web index pages that lists hypertext links to each related document found. The querying server then automatically posts these index pages to the same location as the generated map and updates the map's

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hypertext database to associate the map coordinates with the generated "navigational" pages. Finally, the querying computer automatically sends an email to the GIS coordinator, query server coordinator, and the requestor - notifying them of the new URL. The GIS and the query coordinator also receive a report on the production performance within RSA their respective emails.

- 8:00 AM, Washington, DC suburbs - Eastern Standard Time

The executive logs out of the home office server and leaves his home for his first appointment.

- 8:00 AM, Columbus, Ohio - Ohio State University School of Fisheries - Central Time

A graduate student studying Bio-Economics decides to write her master's thesis on the "Economics and Effectiveness of Sturgeon Rearing Programs in the Pacific Northwest". She starts up the webbrowser on the University's Macintosh and runs a query against HotBot searching for information sources about the sturgeon rearing program in the Pacific Northwest. Out of the several hundred references she is returned, she notices that there is a project in Willard, WA sponsored by a government utility marketing agency. By selecting the URL leading to the abstract and reports, she finds the URL of the email address of the chief scientist in charge of the project. She emails the scientist with a list of questions about progress of the project, comments, etc.... She also notices a reference to a database that provides project tracking information related to the project and a database that provides annual reports, mapping, and financial reporting related to the project. She finds when she connects to this URL, a URL for the email address of the COTR in charge of monitoring and administering the project for the government. She also emails this individual.

- 8:00 AM, Atlanta, Georgia - Central Time

A 4th grade class in a local elementary school is given the assignment to write reports on salmon. They, via network computers (built from 386 class PCs running Linux), query the internet and also come up with a website that contains a great deal of information about salmon, their habits, and what is being done by a government utility marketing agency to preserve them. They connect to the site, and begin their research with the added bonus of being able to contact all the scientists involved with the program to ask questions.

- 9:30 AM, Washington, DC Bureau of Indian Affairs - Eastern Time

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The executive arrives at his meeting, which is a discussion about up to date project accounting and tracking is being teleconferenced between the tribal leaders of the Colville Tribe in Spokane, WA, the Tribal Liaison Office from the government utility marketing agency in Portland, and the BIA coordinator in the same DC office as the executive. [Connecting to the Home Office in Portland and directing the remote electronic conference attendees to the proper website, the executive connects to the financial tracking system and illustrates that the meeting participants can readily access the current financial status of their projects - up to date within 15 minutes of the last accounts payable entry into database via the internet. He then demonstrates the Java based daily project reporting system - also available via the internet. Finally, after the presentation, he instructs the participants on how to "book mark" the site for future reference.](#)

Meanwhile back at the office, the executive's assistant produces an internal draft memorandum using [wordperfect](#), saving it as a PDF format file, and automatically posting it to the personal archive of the executive for review. At the same time, the archive automatically sends the URL of the posted document to the executive for review and signoff.

- 6:30 AM - Portland, OR suburbs - Pacific Standard Time

Upon rising for breakfast after a good nights sleep, the Division Director sits down and securely (via a secure shell layer) logs into the regional office LAN via his six year old's WebTV, seamlessly connecting via a cable modem to an ISP which forwards the connection via T1 to the home office LAN. (His computer had a motherboard failure and is in the shop for repair...) This creates a virtual private network that cannot be tapped. At this point the executive is connected via an IMAP compliant mail client to the Internet Mail Server and directly reads his new mail in place via the client at a performance rate between 256k and 1.5 mbps (dependent on price/performance comfort....). Upon reading his new email, he discovers that he needs to:

- Prepare debriefing for the Power Planning Council regarding the latest quarterly report that went live the night before.
- Respond to a request from the local press regarding upcoming discussions on ESA listings.
- Read and possibly respond to a PDF formatted document posted on another agency's web site that outlines proposed draft ESA listings accessed via a hypertext link to the URL embedded within the email message.
- Print out a copy of the schedule of appointments for the day.

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Additionally, he finds the email from the liaison in the DC office that gives answers to his RFI sent the previous evening.

He first reads the email regarding the RFI. He then emails his reply, thanking the liaison for the guidance. Additionally, he archives the reply to his personal full-text data archive on the server and erases the original email message. Upon the addition of the new email message to the personal archive server, the computer it resides on begins an immediate rebuild of the archive database making the email message available for query within the following 15 minutes to half an hour and to be backed up in the following automatic system backups occurring the in the evening in Portland.

Second, he responds to the request from the press for the interview, blind "cc"s the reply to the general council for notification purposes, and schedules the interview via ICAL and email response for the following day.

Third, he connects via the URL to the website document proposing draft ESA listings via the hypertext link embedded within the email message - once again using RSA encryption and a secure shell layer to pass through the agency firewall to access the sensitive data. Validation of his access occurs automatically and seamlessly via standard non-vendor specific protocols by the servers at both ends. He reads a section that could possibly have sensitive implications, selects "annotate" from the web browser menubar, and attaches an annotation file to the passage in question. Upon completion of his comments, he archives his comments to his personal Archive database and deletes the email message.

Fourth, he reviews the quarterly report summaries and emails (marked urgent) the COTR for clarification of one project line item.

Finally, he reviews an online version of his calendar.

- 7:00 AM - Portland, OR suburbs - Pacific Standard Time

The Director eats breakfast and readys himself for work...

- 7:45 AM - Portland, OR suburbs - Pacific Standard Time

The Director loads his 6 year old into the car, takes her to school, and continues on to the office

- 6:30 AM - Vancouver, WA suburbs - Pacific Standard Time

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Upon rising for breakfast after a good nights sleep, the COTR sits down and securely (via a secure shell layer) logs into the regional office LAN in her makeshift home office in the Vancouver suburbs with her computer (Sun Workstation), seamlessly connecting via an ISDN line connected to the which is connected to an ISP which forwards the connection via T1 to the home office LAN. This creates a virtual private network that cannot be tapped. At this point the COTR is connected via an IMAP compliant mail client to the Internet Mail Server and directly reads hers new mail in place via the client at a performance rate between 128KBPS and 256Kbps (dependent on price/performance comfort....). Upon reading her new email, she discovers that she needs to:

- Prepare a procurement request from an email received the previous evening from the sturgeon rearing project in Willard, WA.
- Respond to a request from a grad student in Columbus, Ohio requesting information about the sturgeon rearing project in Willard, WA.
- Read and possibly respond to a PDF formatted document posted on another agency's web site that outlines proposed draft ESA listings accessed via a hypertext link to the URL embedded within the email message.
- Print out a copy of the schedule of appointments for the day.

Additionally, She needs to review the project summaries and daily reports from the sturgeon rearing study in Willard, WA before the meeting this AM..

She first reads the email regarding the procurement request. She concurs with the request. She connects to the web based procurement request form, enters the request into the system, and the system emails the requestor in Willard that the action has been initiated. Additionally, she archives the request to her personal full-text data archive on the server and erases the original email message. Upon the addition of the new email message to the personal archive server, the computer it resides on begins an immediate rebuild of the archive database making the email message available for query within the following 15 minutes to half an hour and to be backed up in the following automatic system backups occurring the in the evening in Portland.

Second, she responds to the request from grad student, pointing her to some other materials of interest, and schedules a telephone interview via ICAL and email response for the later that day. She then archives the email into her personal archive database and deletes the email message.

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Third, she connects via the URL to the website document proposing draft ESA listings via the hypertext link embedded within the email message - once again using RSA encryption and a secure shell layer to pass through the agency firewall to access the sensitive data. Validation of her access occurs automatically and seamlessly via standard non-vendor specific protocols by the servers at both ends. She reads a section that could possibly have scientific implications, selects "annotate" from the web browser menubar, and attaches an annotation file to the passage in question. Upon completion of her comments, she archives her comments to her personal Archive database and deletes the email message.

Fourth, she connects to the java based project tracking system, reviews the summary reports and gant charts, makes note of the "flagged entries", and drills down through the dailies to the point where the project seemed to begin to get behind schedule to determine the problem..

Finally, she reviews an on-line version of her calendar - verifying a scheduled meeting at 9:00AM in Willard, WA with the sturgeon rearing study project team..

- 7:00 AM - Portland, OR suburbs - Pacific Standard Time

The COTR eats breakfast and readys herself for work...

- 7:45 AM - Portland, OR suburbs - Pacific Standard Time

The COTR heads to Willard, WA for a 9:00 AM Meeting.

- 6:30AM - Willard, WA - Pacific Standard Time

Upon rising for breakfast after a good nights sleep, the Project Lead sits down and securely (via a secure shell layer) logs into the regional office LAN in her makeshift home office in Willard with her computer (DEC Alpha Clone), seamlessly connecting via a 56K modem line connected to the which is connected to an ISP which forwards the connection via T1 to the home office LAN. This creates a virtual private network that cannot be tapped. At this point the COTR is connected via an IMAP compliant mail client to the Internet Mail Server and directly reads hers new mail in place via the client at a performance rate between 28KBPS and 56Kbps (dependent on phone line quality....). Upon reading her new email, she discovers that she needs to:

- Meet with the COTR for her project to discuss progress and O and M.
- Respond to a request from a grad student in Columbus, Ohio requesting information about the sturgeon rearing project in Willard, WA.

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- Review the current financial status of her project via the financial tracking system.
- Read and possibly respond to a PDF formatted document posted on another agency's web site that outlines proposed draft ESA listings accessed via a hypertext link to the URL embedded within the email message.
- Review an on-line copy of her schedule of appointments for the day.

Additionally, She needs to review the presentation she has posted on her web server as well as her notes before she makes the presentation at 9:00AM this morning.

First, she responds to the request from the grad student, pointing her to some other materials of interest, and schedules a telephone interview via ICAL and email response for the later that week. She then archives the email into her personal archive database and deletes the email message.

Second, she connects via the URL to the website document proposing draft ESA listings via the hypertext link embedded within the email message - once again using RSA encryption and a secure shell layer to pass through the agency firewall to access the sensitive data. Validation of her access occurs automatically and seamlessly via standard non-vendor specific protocols by the servers at both ends. She reads a section that could possibly have scientific implications, selects "annotate" from the web browser menubar, and attaches an annotation file to the passage in question. Upon completion of her comments, she archives her comments to her personal Archive database and deletes the email message.

Third, she reviews the entries in the financial tracking system up to the previous COB, and notes that her latest request has not been entered into the system yet.

However, as she is sitting there, a new email comes in verifying that the latest request has just been added to the system and is "in-process".

Fourth, She connects to her website and walks through her presentation -complete with maps from the GIS server, financial reports from the financial tracking system, hypertext references to support information, graphics, and conclusions. Upon confidence that the presentation is ready, she emails the URL for the presentation to the potential attendees of the 9:00AM meeting and interested parties.

Finally, she reviews an on-line version of her calendar - verifying a scheduled meeting at 9:00AM at her office with the COTR..

- 7:45 AM - Willard, WA - Pacific Standard Time

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The Project Lead eats breakfast and readys herself for work...

- 8:45 AM - Willard, WA - Pacific Standard Time

The Project Lead leaves her house, walks across the compound, and arrives in her office to meet the COTR from Vancouver to begin the meeting.

- 8:00AM - Lewiston, Idaho - Pacific Mountain Time

Upon rising for breakfast after a good nights sleep, the a member of Power Planning Council staff sits down and securely (via a secure shell layer) logs into the regional office LAN in her makeshift home office in Lewiston with her computer (a Pentium 450 with 128 MB Ram), seamlessly connecting via a 56K modem line connected to an ISP which forwards the connection via T1 to the home office LAN. This creates a virtual private network that cannot be tapped. At this point the COTR is connected via an IMAP compliant mail client to the Internet Mail Server and directly reads hers new mail in place via the client at a performance rate between 28KBPS and 56Kbps (dependent on phone line quality...). Upon reading her new email, she finds amid the jumble of new email messages:

- There is a meeting/presentation on the current status of the sturgeon rearing program in Willard WA that is accessible via teleconferencing and the web.
- The latest quarterly report for the Fish and Wildlife program is on line as of last night.
- There is an opportunity to read and respond to a PDF formatted document posted on another agency's web site that outlines proposed draft ESA listings accessed via a hypertext link to the URL embedded within the email message.

Additionally, She needs to review her schedule of appointments for the day.

First, she connects to the conference in Willard via telephone bridge and accesses the presentation via the web URL given in the email message, enters the meeting into her ICAL server, deletes the email message, and starts a WordProcessing client (AMI-PRO) to take notes. Additionally, she vaguely remembers some correspondence regarding this project that passed over her desk a few weeks ago. She opens another client that brings up a query window in which she types "Willard WA, Sturgeon Rearing. this returns a hypertext enabled listing of all personally archived correspondence/documents that contain the key words and a probability statistic as to whether the document is what she is looking for. She quickly finds the document in question and reviews it, all while listening to the conversation in Willard. Additionally, she decides to review the current year workplan. She connects via another window to the web to a database of all project proposals for the current year, seeks out

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the sturgeon rearing project, and opens it via the acrobat reader plug-in in her netscape browser.

While doing that, she also reviews an on-line version of her calendar for the day, and eats breakfast in her bathrobe and pajamas.

- 10:00AM - Lewiston, Idaho - Pacific Mountain Time

Upon completion of the meeting, she saves her meeting notes in PDF format and posts them to her Personal Archive.

Showers and dresses to return to her home office and additional work, including an email message to the division director and COTR on the quality of the presentation that was just given in Willard.

- 10:00AM Liaison Office - Washington, DC - Eastern Standard Time

The administrative assistant for the executive receives an email message that references a meeting in California that requires the attendance of the executive. She verifies the availability of the executive with the ICAL server, and turns her web browser towards a airline reservation website. She finds an acceptable reservation and bookmarks the page for later referral. Additionally, she does the same for hotel reservations.

10:45AM Liaison Office - Washington, DC - Eastern Standard Time

She confirms that the executive wants to attend the meeting, returns to the web pages and makes the reservations.

The executive logs into his email and works on responding, archiving, and initiating actions based on his schedule and the contents therein.

- 11:45AM Liaison Office - Washington, DC - Eastern Standard Time

Lunch

- 11:00AM - Willard WA - Pacific Standard Time

Upon completion of the meeting, the COTR logs into her internet mail server from the office in Willard and checks for new mail that requires attention. not finding anything that requires immediate attention. She begins her trip back to the office in Portland.

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The project lead then returns to her responsibilities and begins writing her daily status report.

- 11:00AM - Portland, OR - Pacific Standard Time

The Division Director attends various staff meetings until 11:00 AM. Upon returning to his desk, his assistant debriefs him on items that need his attention, and he retires to his office to respond via email to the immediate items.

The administrative assistant for the director receives an email message that references a meeting in California that requires the attendance of the director from the administrative assistant for the executive. She verifies the availability of the director with the ICAL server (the administrative assistant for the executive had already scheduled it for the division director), and turns her web browser towards a airline reservation website. She finds an acceptable reservation and bookmarks the page for later referral. Additionally, she does the same for hotel reservations.

She confirms that the director wants to attend the meeting, returns to the web pages and makes the reservations. She then emails the administrative assistant in DC confirming the director's attendance at the meeting.

The interactions continue throughout the day between all the mentioned parties, additional affected parties, and the world at large. By close of business, the computers begin the tape archival process, cleanup of the days scramble, and do it largely without human intervention. If implemented correctly, most support personnel need only be on site during core business hours.

The examples contained herein are just that - examples (perhaps overly simplified in an attempt to illustrate the possibilities and the efficiencies that would be realized with their implementation). I hope you can get the idea from my ramblings.

The technologies referred to herein are not:

1. Rocket Science - the bulk of these things can be accomplished rather simply and inexpensively - they just require analysis of the process and an unbiased view of technologies. Most of the subroutines can be accomplished with humanly readable "interpreted" languages.
2. Expensive- though initial upfront costs related to infrastructure suffer from sticker shock, the savings over the long term greatly offset the initial costs. Part of the cost problem is that some much technology has been implemented that cannot be modified to realize these goals, that most of it would have to be torn out and we would be starting from scratch. Most of what has been implemented

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has been implemented to the benefit of the IT professional while disregarding potential efficiency gains of what I refer to as the knowledge worker. Supplanting the knowledge worker by increasing the IT professional support requirement is NOT an efficient use of technology and results in increased costs and inefficiencies.

3. Radical - most of the technology to be used in these scenarios has been around for up to 30 years, it's just a different way of applying it by carefully reviewing how we currently do things before applying the technology. Many of the solutions have nothing to do with modifying technology, but rather modifying procedure using current "in-place" technology.
4. A big risk or gamble. These technologies are based on well documented and open standards, require little or no vendor support, and are extremely reliable (in most cases more so than the vendor solutions...) Additionally, they are modular in scope, replaceable in the event that something "new" comes along without breaking a significant number of dependencies.

This scenario is very possible given today's technical environment. The potential gains in communication efficiencies are almost incalculable. These simple procedural modifications, along with enduser acceptance and experimentation could very quickly and radically change the way we do business in a "win win" situation for all parties involved. Technically it is all possible, attitude, training, and enthusiasm are the determining factors.. Implementation timeframes are largely open depending on management commitment to resources and desire to get the gaps into place. Given current FTE allocation, lobbying required to gain acceptance and scheduling, we are looking at a 3 to six year timeframe to realize the examples above. With a realignment of current tasks/workload of existing staff and the addition of two FTE for a period not to exceed 18 months -most of this could be realized within a two year period. By the 5th outyear, I anticipate that automation and user interfaces will be high level enough to pretty much supplant computer support personnel with non-IT personnel (using the technology as standard operating procedure) with the exception of perhaps one systems maintenance person to keep the lights on.