VIDEOTEX INFORMATION PACKAGERS: A FIELD STUDY AIMED AT TOMORROW'S VIDEOTEX AUTHORING INTERFACE

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Abstract:
Twenty-Three professional Videotex Information Packagers (**VIP**: graphic artists, database architects, wordsmiths, etc.) were interviewed about current work habits with an eye toward the implications for **VIP** automation. Interviews were taped and transcribed for semi-mechanized content analysis. Photographs of work areas and materials were also made. Observations include: heavy continuing reliance on paper notes and records; a frequently frustrated need on the part of **VIPs** for a variety of database listings in different formats (graphic and textual) at differing levels of detail; desperate need for more compatibility among the various hardware and software elements in the graphics/text/database synthesis process.

ACM Categories and Subject Descriptors: C.0 [*General*]: Hardware / software interfaces; D.m [*Software*]: Software Psychology; H.1.2 [*Models and Principles*]: User/Machine Systems -- Human Factors; I.3.4 [*Computer Graphics*]: Graphics Utilities -- Graphics packages, Picture Description languages; I.7.2 [*Text Processing*]: Document Preparation -- Format and notation, Photocomposition; J.5 [*Arts and Humanities*]: Arts, fine and performing

General Terms: Experimentation, Human Factors

Additional Key Words and Phrases: Videotex, Information Provider, authoring system, task analysis, engineering psychology.

Introduction

Videotex systems of the future will integrate text, graphics and color in high-function database management systems which will be accessed by a wide variety of users. Enhanced navigational and query techniques will make the medium more interactive than it has been in the past. The Videotex Information Packager (**VIP**)[1] is a new class of professional responsible for creating the graphical/textual page content and describing the linkages and descriptions that will hook those pages together. Expanding end-user populations and expanding function combine to present a usability challenge to these **VIPs** who are, in fact, creating user-computer interfaces every time they put a database together.

How do **VIPs** meet this challenge? How do they use current technology to rendezvous with their end users? Are the tools available to **VIPs** sufficient to help them in their task? [2] If not, what sorts of needs have yet to be fulfilled? What contribution can Human Factors make?

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[1] Some people call the Videotex Information Packager an Information Provider (*IP*). More commonly, the IP is the person or entity owning the content that **VIPs** put into databases. See the glossary in the appendix.

[2] In discussing a telephone survey of **VIPs**, Steven Kerr speaks of a "crying need that everyone feels for more sophisticated software tools <for graphics & text creation an synthesis>" (Kerr, 1985). Similarly, one manager of a busy Videotex editorial department declared that his group experienced a 60% productivity degrade due to the inadequacy of their computer tools.

The normal task of a Human Factors engineer or Engineering Psychologist is to build into a human-machine interface those characteristics which make it easy to use by its intended user population. In the case of the **VIP** interface, however, the Human Factors contribution must be made more indirectly -- by proxy, as it were. Any assistance that Human Factors can offer to **VIPs** will be multiplied when propagated down via the databases they create to the end users of those databases. It is for this reason that the design of tools for **VIPs** represents a wonderful opportunity for the field of Human Factors. However, if tools are ever to be conceived which will help **VIPs** build usable databases, we must first understand who they are and what the job is that they do. The purpose of the research reported here is to define that population and make contact with it.

The fledgling Videotex industry can add little reliable resolution to the question of who or what is a **VIP** (field trials of Videotex delivery systems on this continent have only been happening since 1980. However, as varied as the current approaches to creating Videotex databases are, there **are** places where such work is going on (albeit directed toward today's delivery technology). The purpose of the field research described here is to sample those places and attempt to draw some generalizations about how **VIPs** do their job (at least insofar as those conclusions hold implications for the design of advanced Information Packager tools).

Method

Data were collected via loosely-structured in-depth interviews which were recorded on audio tapes and transcribed for semi-mechanized content analysis. The interviews were conducted during the 10-month period from June 1984 to April 1985. Photographic "archeological" evidence was also collected from job sites (notes, worksheets, workstations and work areas, etc.).

The completed transcripts were first edited electronically to remove personal references and ensure participant anonymity. Hardcopy was generated and analyzed by the experimenter. Analysis began with the manual highlighting of participant comments in groups according to pre-established content categories and tagging each group appropriately. The electronic source files were then edited and the comment groups were isolated, "cleaned up" (correcting punctuation and format, deleting superfluous utterances), and abstracted into abridged participant source files. This was a 62% data reduction. These same comment groups were also sorted by category into topic files. Since each comment could be sorted in more than one category, this step represented a data expansion of 301%. Editing macros and utilities, described elsewhere[3] were devised

specifically for the analysis and their design was iterated throughout the process.

The Corpus

The 14 original source files occupied 1196 Kilobytes (Kb) of computer storage (range=36Kb-184Kb) or some 400 pages. The 14 abridged source files were 456Kb (range=12Kb-60Kb) or 130 pages. The 27 topic files totalled 920Kb (range=8Kb-120Kb) or 242 pages.

Participants

Interviews were conducted with Twenty-three professional **VIPs** representing a variety of roles in this ever-changing industry. These job roles are listed below, with the numbers of participants occupying each role in parentheses (these add up to more than 23 since **VIP**'s often "wear different hats").

Job Roles

- Coordinators/Directors of **VIP** shops (6)
- Graphic artists (9)
- DB architects (3)
- Wordsmiths (3)
- Editors (5)
- Production staff (2)
- Technical support & archivists (2)

List of **VIP** Organizations

These participants represent six organizations of varying sizes:
- A large company with a small prototype **VIP** department.
- A university with an inter-disciplinary department doing research and producing Videotex databases under contract.
- A larger, integrated, single-department effort at another university involved in research and the production of databases under contract.
- A successful two-man "garage operation" producing databases and doing consulting work within the industry.
- A subsidiary of a larger publishing-oriented company; this large-scale commercial organization produces databases for hire.
- Also a subsidiary company and also a large-scale producer of databases, this company is also involved in the system operator end of the business.

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[3] The utilities designed for the analysis of the interview transcripts are collected in a package called PROTOCOL PACKAGE which is available IBM-internally and which will be described in a research report at a later date. Contact the author for details.

Results

The following is a sampling of the results culled from the topic-sorted transcripts. Quotes are preceded by fictitious participant names.

Job Roles - Who does what in the VIP shop

There are many job roles extant in the industry, some of which were interviewed in this study (see the *Participants* section). A partial list of the job roles that designers of **VIP** interfaces should be aware of follows:

- Coordinator/Director of **VIP** shops or departments
- "Front-man"; Account executive
- Graphic artists
- DB architect
- Content research; Field reporting
- Wordsmith or Author
- Editor; Wire story "massager"
- Keypunch operator or Text inputter
- Production; Database administrator
- Client liaison; Marketing
- End-User liaison; Marketing research
- Technical support
- Archivist; Librarian; "Paper-Keeper"
- Programmer
- Computer operator
- Administrative support

At the small-operations end of the spectrum, there is a definite tendency to split the creation of Videotex databases into at least two job roles, graphics design and wordsmithy. With just that division, the initiative in database design and workflow tends to rest with the wordsmith. He or she will take the primary responsibility for establishing the structural form of the database (within the constraints established by the clients or content providers) and may make suggestions about graphic elements on the individual pages. Another job role that tends to evolve in growing **VIP** organizations is the technical role. This person is charged with making sense of the myriad of hardware, software and devices for interconnection that proliferates in the Videotex design industry. A coordinator might be required for large scale database design efforts as well as a "front man" to handle interactions with clients or content providers. This contact person might or might not be heavily involved in the day-to-day database production efforts.

In one large newsroom-type operation there were two separate teams of editors working (as many as 5 per shift) on "hot" news stories (right off the "wire" and into the database) and "cold" news stories or

"features". There were also 5 production people and 5 data-entry people per shift in that organization.

Job role evolution Even in organizations that have had a few years experience (ancient in Videotex terms), things change.

> *Megan:* And even jobs evolved. What we thought needed to be done when we first started out turned out that didn't need to be done but something else needed to be done.

Specialization As with any new venture, the pioneers are curious about all aspects of their emerging profession, but, in spite of an incipient "jack-of-all-trades-ism", **VIP**'s tend to do mostly what they do best.

> *Mat:* Everybody did a little bit of everything, but people did fall into primary areas.

Different people have different feelings about this specialization of roles. A supervisor might like to vary people's routines:

> *Babby:* I also had rotating responsibilities so one person would be like the captain for the week or the manager for the week.

And a wordsmith might feel specialization to be an unnecessary narrowing of skills:

> *Bernice:* I think that <specialization of equipment/job roles is> a silly way to approach it because it's a matter of putting human beings in certain spots and saying "You can only do this," when one might think one has the ability to do "that".
>
> In terms of the specialization, one does need an aesthetic visual sense as a writer to put the things together.

But an artist might prefer to stick to his own domain:

> *Bob:* I'm good at drawing the pictures. I have the capability of <designing and charting databases>, but it's not what I'm interested in doing. I don't really feel that that would be where I should be spending my time.

Production people might be responsible for validating the content and linkages of news stories they receive from editorial people while they are committing those pages to a delivery system database, but there is a potential inefficiency:

> *Madge:* The editors knew the material best. The production department knew it by codes and by words but the people who had done the work actually knew what should be there, therefore they were the best ones to judge whether it was correct or not.

The coordinator/supervisor role is usually a pretty casual one as noted by the rotations in Babby's group and here, by Madge:

> **Madge:** Really the primary responsibility <of the newsroom supervisor> was just to make sure that everything was roughly done on schedule, that everybody didn't jointly forget about the World News section, <for instance>. It just was kind of a coordination role.

Any given group will have their own conventions or breakdowns of roles:

> **Mat:** We had, in the past, <...> essentially two types of artists, an editorial artist and an advertising artist. That has a significance insofar as the degree to which they create from scratch. Editorial artists -- tended to have to flesh things out from a real, from a blank screen. There's really nothing provided to them except content from which inspiration was derived. Advertising, on the other hand, we would in some cases -- it varied but there was always a fairly large degree of guidance from advertising providers.

Background & previous experience

VIP's are likely to come from a variety of educational and experiential backgrounds.

At this stage in its development, the Videotex design industry cannot draw on a pool of graphic artists with appropriate backgrounds; a page design artist may have had no computer experience at all upon being hired, not to mention experience with computer graphics or CAD/CAM-type packages. Few database architects seem to have much previous experience with traditional computer databases. This isn't necessarily accidental either:

> **Betty:** So when we hired people we looked for the qualities that one doesn't normally look for. We didn't look for artists, we didn't look for graphics designers, we didn't look for computer people, we didn't look for all the things that you might think we'd look for because we looked for people who would work together with us and figure out what we were doing.

Staffing & training

It often happens that people are hired on as temporary contractors ("free-lancers", "per-diems") to perform different roles (notably content research, text input, and graphic artwork) for the duration of a particular project.

As Betty mentioned above, priorities in staffing don't necessarily begin with finding people with appropriate backgrounds:

> **Babby:** It's the new technology -- people who come in who are trained as writers, are trained as artists, are not usually the best people.
>
> People can lose things through training because they take it too literally. Down the road, when you're hiring for, you're hiring 25 people to run a system, certainly you're going to have to break up the skills a little bit.

Training of new **VIP**'s is often a casual matter. Graphic artists often learn to use their FCT equipment by working through whatever documentation is available more or less on their own.

> **Burt:** I won't train anyone on the FCS unless they've used something else first because the FCS is just too confusing. <In the IPS> there are a couple of programs that are real simple to use that give you the basic line, draw, circle, rectangle. The IPS has a help function, so if they ever get in trouble they could look. IPS also has very good, compared to the FCS, has really good documentation.

One shop uses videotapes of end-user sessions to give new artists a feel for the style of the shop:

> **Burt:** When you bring them in originally you can very quickly show them "OK you see how we started out, you see all the colors, and now look at this and now look at this."
>
> It seems like everyone will sort of start out, not start out the same, but they have the same ideas. When they originally start they just, they try everything, they try to, they try to sort of take the machine to what they think is its limits.

Internal VIP shop communications

Meetings among members of a **VIP** shop to review work-in-progress are common.

> **Megan(?):** For the first three months <of the field trial>, there was a daily meeting of the director, editorial, advertising, graphics, production. I think that's everybody, and maybe a manager from each of those departments that got together. It was very much the Lou Grant kind of thing. It was everybody meeting and saying "What's on the table?", or "What's coming?" or "What's going? Is the schedule being met?", that kind of thing.

These meetings also provide specific opportunities for the critique of database designs and graphic pages. The

frequency of these in-house meetings can vary. There might be a daily review in the morning of all the pages that have been put into service or a weekly meeting where one or more artists present their ideas to a group (including peers and superiors) for review and comment. The frequency of meetings sometimes tapers off once a project gets running smoothly.

> **Betty:** Now the interesting thing about the way we worked was that every morning, we all sat and looked at the frames and we all critiqued the frames and we all said "What's wrong with that frame? What's wrong with that? What's the matter with it? What's the problem with the color? What's the problem with the design? What's the problem with the shape?"

As with **VIP**/Client communications (see below), the prospect of using telecommunications technology to moderate in-house communications is met with mixed feelings.

> **Betty:** You have to build a lot of trust. <...> It requires a sensitivity and body language is very important. You can see if somebody is stiffening up but you can't see it over the phone.

> **Babby:** I prefer to walk in and have kind of like a human contact with the person, particularly if I was going to radically change their best piece.

> **Bob:** It was one of the best experiences I've had working within a group, with other people.

> **Megan:** To a large extent we never used the messaging facility <we had in the TMS system> for the very reason <that you could holler over the divider:> "Hey Mona, have you finished?" <...>

> Everybody knew each other pretty well and the atmosphere was kind of laid back. I don't know if yelling is included in laid back, but just whatever worked best -- There were like ... cubicles.

> **Mat(?):** The more automated that you get, the greater barrier you put between myself and Megan to come together fast and get those polaroids to look right. You know, things like that.

When asked about the incessant need to telephone the production department every time a news story was ready to be committed to the delivery system, Megan did suggest:

> **Megan:** Yeah, there has to be easier ways to do it and I don't think you ever want to lose

human contact, but there could be an easier of way of just sending them a message and saying when a story goes over <or> have a message attached to that that says "This story is here," or whatever.

In-house critiquing can be a more casual affair of peers or superiors dropping into an artist's office or being called in to give an opinion. At "BBC", one or more people would often cluster around Bob's terminal for brainstorming sessions. Other artists find that difficult to deal with:

> **Jill:** I don't think it's fair to the person working on a frame creation terminal to stand behind them. I think that's being rather obnoxious.

Time pressures sometimes inhibit the free contact among peers:

> **Mike:** We had an environment where we barely could, we didn't get to see what each other did very often because we were too busy.

Workflow – day in the life of a page

Many existing systems focus on the creation of pages and linkages from scratch. There is a growing feeling among some **VIPs** that the **VIP** process of the future will be more a matter of assembling pages and databases from components existing in a variety of sources. This might include standard (possibly proprietary) libraries of graphic elements, external data files, or other existing database linkage structures.

Various, mostly informal, mechanisms exist for making sure a static page gets checked or reviewed by someone other than the person who created it. Often, it is the person who commits the page to the database (i.e., the production staffer) who gives it the once-over for spelling or grammatical errors.

> **Babby:** The next person who saw it in our system was the person who was transferring that file to the actual -- putting it on the system so it was like a final proofing.

Contact between VIP's and content owners

Communications failures in existing **VIP** systems often make turn-around time prohibitively long. There is often too large a gap between the person with the content and the person implementing that content as a Videotex database. There would seem to be a need to show and discuss work-in-progress at the content provider's location without having to make personal visits, mail diskettes, or create and mail photographs and drawings.

Client-VIP Telecommunications

There is a social aspect to contact between **VIPs** and the content providers, especially when there is a contractor/client relationship involved. Asked whether futuristic telecommunications technology[4] would assist in the process, most participants were enthusiastic but mentioned the need to have face-to-face contact at least at first:

> **Sam:** Being on-line, even in that kind of real-time transaction environment is not the same psychological situation as having the guy come to you and, you know, be there

> **Steve:** I think with many clients, you do have to have the hand on flesh at some point or other.

One advantage of an electronic communication channel between client and **VIP** was the distance afforded between the client's criticism on the one hand and the ego of the artist on the other.

End-user view of emerging databases

VIPs need some mechanism to see the emerging database as the end user will see it. Existing systems don't allow the designer to toggle out of the design mode and "try the system out" to see how it hangs together. **VIPs** have evolved a variety of bizarre solutions to this problem.

Statistics (Work output)

As interesting as it would be to know, it is notoriously difficult to estimate the average amount of time it takes to create a single Videotex page. Once an attempt is made to factor out the time to establish the theme of the database and the time to design the database structure, estimates still vary wildly.

Graphic content creation

One recurring theme is the lack of compatibility between today's various text input, graphic creation, and productions systems. One **VIP** spoke of the need in her group to coordinate the work of text formatting, merging with graphics, linking and committing to the delivery system on no less than four different display stations.

Sketching, pen and pencil on paper

Current **VIP** work patterns often involve sketching a graphical image first on graph paper (special forms are

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often contrived for the purpose). **VIPs** complain however, that, in that medium, What You See Is NOT What You'll Get on a CRT. This failure to use electronic media from the very start of the design process may be a powerful statement about the availability and usability of existing electronic image creating systems for sketching.

Designers responsible for graphic elements of pages often desire or require fine control at the pixel-by-pixel level. Preliminary sketches often include laborious coordinate planning.

Storyboarding

A storyboard is traditionally a single-sheet sketch of a number of pages which will appear in the delivery system in a sequential collection. (Storyboards could also represent a fragment of a hierarchical database.) When made by the artist for in-house use, the storyboard is usually a rough, monochrome matrix with rough graphics and verbal content "as bare as possible." (See Figure 1.)
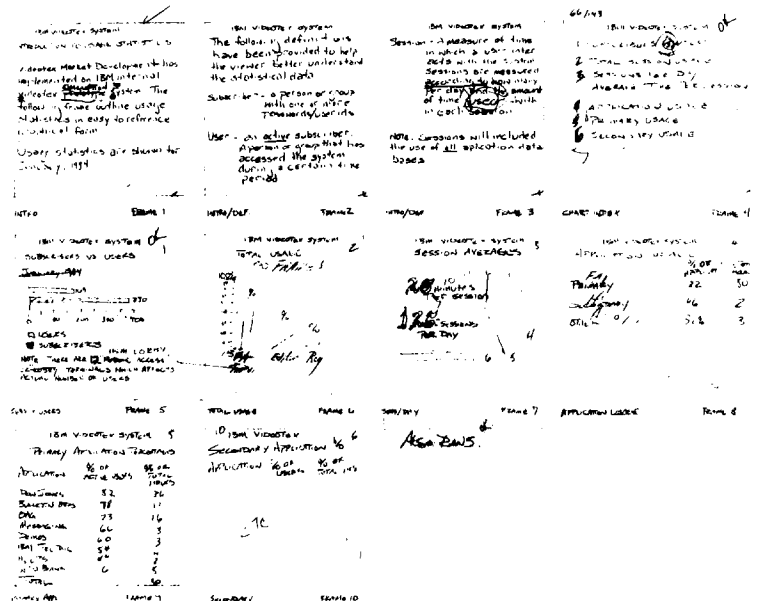

Figure 1.   Storyboard for in-house use

Sometimes a **VIP** will prepare a more elaborate polychromatic storyboard with commercial graphic tools to aid in presentations (sales pitches) to clients (content owners contracting the database production out to the **VIP**).

Text creation

There seems to be a general frustration with the 40-column text limitation in current Videotex delivery systems [5].

> **Mike:** I hated working with 40 columns. I'm a real 80 character proponent.

Though Madge found a silver lining:

> *Madge:* I think I was the only one maybe, but I found a great deal of reward in taking a wire story and turning it into a Videotex story because there was a great deal of difference. Wire stories just don't, just aren't readable on a screen in their original <verbose> form.

Listings, finding one's way around an emerging database

VIP's needs in terms of the level of detail in a database listing vary from moment to moment. At times a database architect (or, more often, a coordinator or project manager) will need to see the "big picture" for a database in progress. To this end, more than one **VIP** has created wall-sized murals for their own use with a hodgepodge of tape and bits of paper in order to show linkages and content. At other times, a close-in view of, perhaps, a single parent-children linkage will be required, showing a greater level of detail. Different **VIP**s have evolved different conventions, both graphic and textual, for displaying different levels of information.

VIPs involved in the graphic content of Videotex databases often feel the need for more visual ways of representing elements in browse lists or maps. Strictly textual listings or descriptive representations may be of limited utility here. Perhaps database maps should show the predominant colors of each page allowing the **VIP** to verify the propagation of color themes. Some minimal graphic representation of the key iconic elements of each page may also serve a similar useful function.

There is one apocryphal story of a **VIP** who uses, for his page and library listings, a Rolodex file (Kerr, 1985).

Archiving

Except for use in training, archive records of old Videotex pages are rarely used (this does not include active libraries of pages and page components which are heavily used). However, there is a strongly perceived need for reliable, well-catalogued archives. Larger **VIP** organizations tend to have one person who is mainly responsible for making sure that page creation system disks are backed up regularly.

The paper office

Examples of new and/or counter-intuitive information have included the following:

There is a continuing heavy reliance on paper notes and records for keeping track of work-in-progress. This is underscored in Figure 2
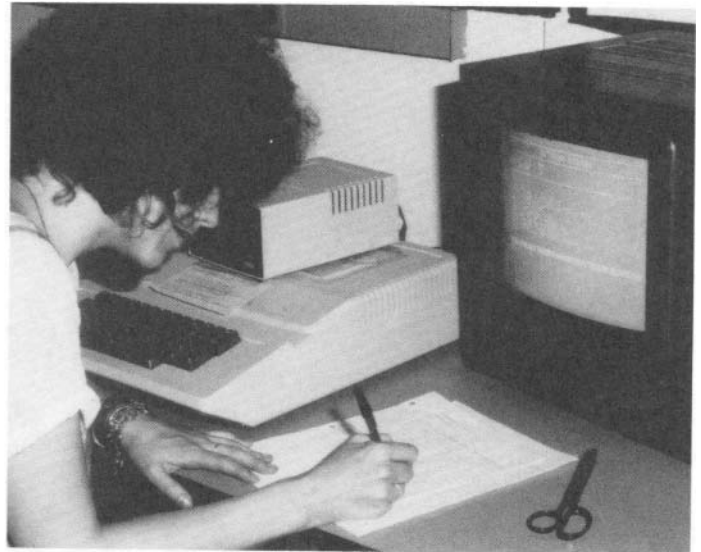

Figure 2.   **VIP** working on database linkages

by the presence of the scissors at the workstation of one database architect. They do not appear there by chance; a careful inspection of Figure 3 reveals a splice about two thirds of the way down the listing where one laboriously crafted fragment was appended to another.
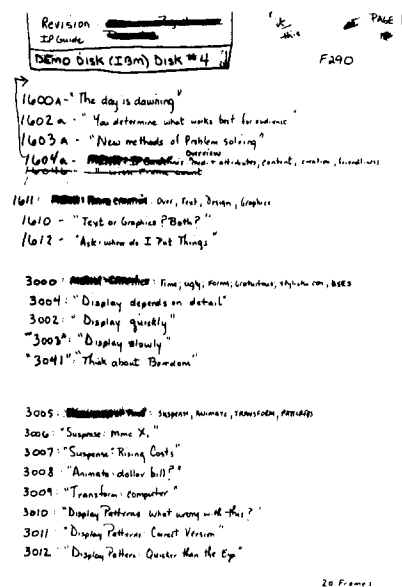

Figure 3.   Verbal listing of database structure

A **VIP** shop often has "well-thumbed" index notebooks for each database as well as reference notebooks showing listings of graphic libraries. (See Figure 4.) These notebooks are passed around from

hand to hand, annotated, often in different colors to show the progress of a database-in-design.

Figure 4.   Database index ("production bible")

Ergonomics, Human Factors, mice vs. styli

The ergonomics of **VIP** workstations -- keyboard(s), tablet, screen(s), printer, disk drive -- often appear awkward or haphazard. One **VIP** shop has installed so called "back chairs" (a contrivance combining kneeling and sitting for propping a **VIP** up at a terminal for long stretches).

Arrangement of pointing devices (stylus, mouse, tablet) and keyboards becomes a significant problem when the complexity of the equipment reaches the current state of things for **VIPs**. Shifting from one input device to the other is awkward, a fact with obvious implications for the design of work flow in database creation systems.

Electromagnetic tablets are proliferating in this new industry, as are "floppy diskettes". Unfortunately, the former provides a dangerously attractive resting place for the latter.

With as many as three keyboards, two to four CRT displays and one or two pointing devices, clutter tends to be a salient aspect of database creation workspaces. Since source materials for graphic design tend to have a larger "footprint" than source materials for text, things can get pretty crowded. See Figure 5.
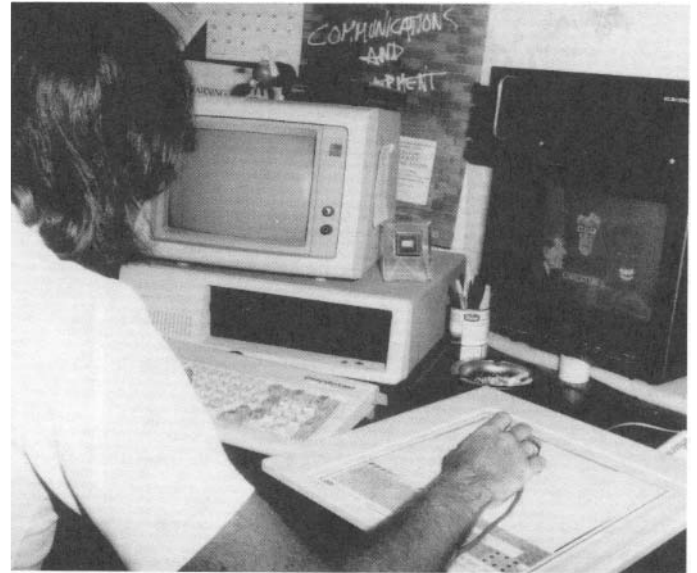

Figure 5.   A cluttered **VIP** graphic creation workstation

And that doesn't even account for the potential conflict between spilled coffee and input devices!

Miscellaneous (Views on Videotex)

General Vocabulary

One advantage to the method of audio transcription and analysis is that it provides a good corpus of specialized language usage. Efforts to find a common language are productive (and inevitable) in any new industry. The glossary contains a sampling of the specialized language that is evolving to satisfy the needs of Videotex professionals.

Conclusion

Designing for VIPs

The Videotex industry is an emergent one; the subject of this study is a moving target. While any effort to design tools to help the **VIP** must remain adaptable to that change,[6] there are certain facts about the target population of **VIPs** that are knowable in advance.

Examples of observations from this study include:

● Heavy continuing reliance on paper notes and records for keeping track of work-in-progress,

● A frequently frustrated need on the part of **VIPs** for a variety of database listings in different formats (graphic and textual) at differing levels of detail,

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6   Gould & Lewis, 1985 and Kelley, 1984 both contain apropos discussions of an interface design methodology whose whole raison d'etre is adaptability.

- A desperate need for more compatibility among the various hardware and software elements in the graphics/text/database synthesis process,
- Varying **VIP** needs in terms of the level of detail in a database listings,
- Necessity for visual ways of representing elements in browse listings or database maps,
- A need for end-user's perspective on emerging databases,
- A growing feeling among **VIP**'s that the creation process of the future will be more a matter of assembling pages and databases from existing components rather than creating pages from scratch,
- Early focus on paper and pencil sketches for graphical images (special forms are often contrived for the purpose),
- Perceived need by some graphic artists for fine control at the pixel-by-pixel level,
- Communications failures in existing **VIP** systems (content - implementation) often make turn-around time prohibitively long,
- The ergonomics of **VIP** workstations -- keyboard(s), tablet, screen(s), printer, disk drive -- often appear awkward or haphazard.

About this methodology

There are many ways to collect self-report data from participants. The open-ended, unstructured interviews used in this study represent one end of a spectrum ranging on the other end to mass-mailed structured questionnaires.

Disadvantages

The method used here (echoing methods described in Kelley & Chapanis, 1982) is undeniably labor-intensive. Even without the rigorous coding of a formal content analysis (See Ericsson & Simon, 1984 for details in "Think Aloud" applications), the production and analysis of 400 pages of interview transcripts is a non-trivial undertaking. With today's machinery (i.e., no automated transcription hardware), the process of building and analyzing these transcripts is extremely cumbersome and time-consuming (custom-designed utilities notwithstanding). The question remains: what is the gain, how much more is learned for the extra effort over simpler methods? As interviewer, I was able to digest a large proportion of the content of the interviews just from being there and taking notes on my own (though I sacrificed some completeness and accuracy in those notes in favor of maintaining the flow and spontaneity of the conversation since I knew the tape recorder was getting it all). However, there was a significant additional amount of information to be gleaned from the transcripts [00].[7]

There is an element of subjectivity in the analysis step. This is actually a potential hazard of the entire unstructured interview process.

Advantages

In spite of the amount of labor entailed in their production, there is unquestionable value in having a categorized, sorted transcript collection as a reference source to show people involved in production of tools and prototypes. A second-hand report about the preferences and reactions of the user population has nowhere near the impact of a transcript of the users speaking for themselves on issues that impact interface design.

In defense of the extra time spent categorizing the source transcripts, I believe that the sorted topic files to be qualitatively superior to the unanalyzed source transcripts, and of much greater use for other consumers of the information contained therein. (Who, besides me, is going to take the time to wade through all the irrelevant material for the substance?)

Making annotated, organized transcripts available directly to designers allows the user population to "speak for themselves" to a certain degree.

Regarding the subjectivity of the method, it is the opinion of this author that, for exploratory purposes, this method yields a far richer, if less quantitative and reliable body of information than would any questionnaire methodology.

Recommendations

Good fidelity, noise reduced, stereo recordings are extremely important for accurate transcriptions. Noisy conditions in the field combined with the transcriber's lack of familiarity with the participants to make speaker identification in group interviews a real problem. Stereo cues help resolve speaker ambiguity to a great extent.

In individual and group interviews, word recognition was often difficult, even for me, and I was there, I know the participants and the subject matter. The following phonological confusion illustrates this point:

Heard: "...wrinkle glue instead of residential glue..."
Said: "...regal blue instead of presidential blue..."

Unfortunately, currently available transcribers all have some subset of the following problems:

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[7] At the risk of making an irresponsible estimate, I will "shoot from the hip" and suggest, for the sake of conversation, that an additional time investment of 1000% (not counting development time for the analysis utilities) yielded an additional 30% to 50% information.

- The machine is set up for "micro" dictation cassettes, not standard audio cassettes for which there is a multitude of recording gear on the market.

- The playback head has a non-standard audio track alignment resulting in the loss of part or all of one of the channels in the monaural playback mode.

- There is no noise reduction decoder (i.e., Dolby or DBX).

- The fidelity is poor.

- None of the models I found could play stereo, not to mention noise-reduced stereo of any high quality.

In order to take advantage of the advanced transport mechanisms available in transcribing gear (foot-pedal operation, variable speeds, auto-backup, cue/review) I had an "off-the-shelf" model customized so that the internal monaural audio circuits could be bypassed with an external high fidelity amplifier (it turned out that, with this particular transcriber, the playback head was a standard stereo head which could be re-aligned and re-wired for conventional stereo audio tapes).

Extensions/Futures

These transcripts represent a database, a mildly structured body of knowledge accumulated from 23 representatives of this new user population. It would be interesting to make this database available to people designing tools for that population and find a way to loosely track their use of it. Perhaps a questionnaire could be included: "Did you find anything of use to you in these pages? How did it impact design?"

Appendix A. References

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Appendix B.
A Glossary of Videotex Terminology

Client A person or group contracting to have a Videotex database built. The client may also be the **content provider**.

Commit (As in "commit a page to a database") To sign-in or file a page in a delivery system, making it ready for viewing.

Consumer See **End User**

Content Provider A person or group owning or supplying a body of information that is being implemented as a Videotex database.

Control Sheet A pre-fabricated form onto which a &vip. writes linkage information.

Customer See **End User**

Database Architect The person who is responsible for the structural design of a Videotex database, i.e., what pages are linked to what other pages and how.

Decoder The software in the end user's Videotex terminal that translates the incoming NAPLPS data stream into the correct instructions for the end user's display hardware. Sometimes decoder software is combined with special display hardware.

Delivery System The mainframe computer, communications network, and/or decoder that, working in concert, deliver pages to **End Users**.

Direct Linkage The relationship between a menu page and a specific page that comes next when the end user enters a menu selection.

DRCS - Dynamically Redefinable Character Set Often refers to graphic elements in a page.

Editor See **Wordsmith**

End User The consumer of the Videotex **delivery system**, as contrasted with **VIPs** using some kind of Videotex page creation or database design system.

FCS -- Frame Creation System A specific brand-name graphics terminal for creating & editing NAPLPS images.

FCT -- Frame Creation Terminal Generically, a graphics terminal for creating NAPLPS images. Sometimes refers to a specific product.

Frame Most often, a page (see below). Sometimes a frame refers to a sequential set of related pages.

Graphic Artist The person who, working with some kind of graphics device, creates the graphic component of a page's content. The **graphic artist** often also deals with minor text editing.

IP -- Information Provider 1. An individual or group owning information that is to be distributed via a Videotex **delivery system** (see **content provider**).

2. A **VIP** People described in the second definition often have people from the first definition as **clients**.

IPS A specific brand-name graphics terminal for creating & editing NAPLPS images.

Layout Arrangement of the various fields (i.e., input and output fields) on a page.

Library A collection of page components or elements. These are often elements that are commonly used within or across pages. Sometimes, **libraries** are created so that multiple graphic artists in the same **VIP shop** can share these graphic elements.

Linkage Hooking pagesets together in a hierarchical database structure.

Macro A way of referring to a previously-defined graphics/text element. Perhaps an object which is incorporated into several pages or several times in one page.

MRS -- Minimum Reference Standard A subset of the emerging NAPLPS data standard in current use among several **decoder** manufacturers.

NAPLPS -- North American Presentation Level Protocol Syntax (Sometimes defined as the North American Presentation **Layer** Protocol Syntax) The coding scheme for representing graphics and text (**PDI's**) in a compact, procedural way.

Page A single Videotex screen-full of information and graphics.

Page name A sequence of characters or numbers that uniquely identifies a particular page. Conventions often evolve for positional encoding of information about the source, contents, age and destination of pages into the page name.

PDI -- Picture Description Instruction Graphic primitives (e.g., rectangle, circle, text characters, etc.).

Run-Time Page A page that is only partly specified in advance, with variable material being merged in with the static material at a later time (i.e., at some scheduled periodic time, or when the **End User** requests the page from the **delivery system**. (e.g., stock quotations pages; pages with an advertisement that changes periodically).

Production Assembly of databases by some subset of the following actions: merging text files and graphic files into Videotex pagesets, entering linkage information, modifying selection descriptions on menu pages, validating content and linkage information, committing pagesets to a delivery system.

Screen Architect Another term for graphic artist.

Scroll To move around from page to page in a **page set**. E.g., "More/Back", "Down/Up", "Scroll Forward/Scroll Back".

Static Page A page whose contents are fully created in advance of its being committed to the delivery system database. Contrast with **Run-time Page**

Storyboard Usually a graphic representation of several pages that, together, form a database, or, more frequently, a portion of a database. Borrowed from the print medium where pages ("frames") are more often linked together sequentially as in a comic strip.

System operator The organization owning the **delivery system** hardware and administering the database.

Tree The hierarchical structure of a Videotex database.

VIP -- *Videotex Information Packager* 1. An individual responsible for creating NAPLPS graphic content (**Graphic Artist**), textual content (**Editor** or

VIP *Shop* A group of people (usually of differing roles) working together on a Videotex project. Sometimes the **VIP Shop** is a private contractor hiring its services out to **clients** and sometimes it is a department within a larger organization having established needs for database creation. **Wordsmith**), database linkages (**Database Architect**), etc..

Wire Feed (Also Wire Story, Wire Copy) Direct connection between the newsroom of a Videotex service and a wire news service such as UPI or Reuters. Stories come in "off the wire" in full-text format and must be "massaged" by the editorial staff to fit in punch, single-screen packets of information.

Wordsmith The person who controls the textual content of a database. Sometimes this person translates text from another medium (e.g., condenses news from a news service "wire" into a "punchy" form suitable for Videotex presentation). Other times a **wordsmith** will create text from scratch based upon notes and research from a variety of sources (often supplied or directed by the **client**).

Appendix C. Acknowledgments