

ANNUAL MEETING

Presidential Address: “*Quo Vadis Ergonomia?*” *Redux*

By John F. (“Jeff”) Kelley, HFES President



*Jeff at age 12 (left)
and today (right).*

This article offers a preview of John F. (“Jeff”) Kelley’s presidential address, which he will deliver at the HFES Annual Meeting during the Opening Plenary Session on September 23.

Al Chapanis originally asked this question in a 1979 article in *Ergonomics*. The original translation was probably intended to be something like, “Whither/where goest thou, ergonomics?” I’m no Latin scholar, but I believe that *quo*, from the Latin *quor*, could also be translated as “wherefore” or “why,” as in “Why goest thou, ergonomics?” A lot has been said and written about **what** we do, but I promised, when I ran for president of HFES, to think about **why** we do it. With the StoryCorps booth that I hosted at last year’s Annual Meeting in Baltimore, I got a lot of other people thinking about this too. If you’ll bear with me during my 30 minutes at the Plenary Session in New York, I will think about it out loud.

The Actual Address...

[Figure 1. Title slide showing new title: “50 Years of Strategic Initiatives in HFES Science and Practice (broken down by month)”]

Thank you.

For those of you who read my blurb in the Bulletin, I’ve changed the title of my talk. From comments I’ve recently received from Society leaders [gesture at Ian Noy on dias], I didn’t feel that my previous topic had the *gravitas* appropriate for a presidential address. So, instead, I’m going to describe, in detail, the strategic initiatives in science and practice that HFES has undertaken over the last 50 years. [get huge book and slam it onto podium] We have a lot to get through, so I’ll get started.

[Figure 2. Faux data slide, January 1957]

In this first slide, you will see that I’ve created some metrics to evaluate strategic productivity in the areas of Pubs, Meetings, Membership...

[grab phone]

Mom? Mom? HOLD ON, MY HEADSET IS TURNED ON! Mom? [fumble to find headset]

Hi Mom, is everything ok?

Well, I asked you not to call me during my talk...

Yes, you did. No, YOU just called ME...

...you heard my voice in your purse...

Listen, Mom, I’m in the middle of giving my Presidential...

I know, Thank you Mom. I’m proud of you too. Now I’m going to have to...

Yes, Mom, you DID call me. Would I lie to you?

Mom, let me ask you something, you know that little blue-tooth headset you just bought on Amazon? Was that in your purse with your phone?

Ah, I think I know what happened, I used to have that same headset. If you put it in your pocket or briefcase, and if something happens to push against the little button, it will cause your cellphone to re-dial the last number you called.

I don’t know why anyone would want to do that. No, I looked. I could never figure out how to turn that off. Yes, it’s a problem. Yes! Very good, Mom, it’s a usability and ergonomics problem!

Ok, Mom. I’m going to have to call you back...

No, you’re right, they should be more careful when they design these things, but I have to...

Yes, Mom. Someone SHOULD do something...

Ok, I’ll tell you what. Here’s a little something YOU can do. Go to the Amazon page where you bought the headset, ok? You know where it says Customer Reviews? Yes, you write your own

review and tell the story about what just happened. And here's where it will really help, Mom. Make sure you use the words Usability or Human Factors or Ergonomics in your review...

...well, because those words will show up in google searches and will help other people get an idea about all the stuff you and I have discussed about what I do for a living.

Here's another thing, make sure you put in a reference to that website I showed you, yes ERGOWIZARD.COM. Sure, you can use the Consumer Info page, maybe that Top 10 Design Mistakes page there under consumer electronics.

Great. Thanks Mom. Now I really have to get back to my talk here... [finger pages]

...NO MOM, Don't give the phone to Uncle Harry, MOM, DON'T... ...hi Uncle Harry.

Yes, I'm fine. Yes, Maria's fine, the kids are fine. Yup, grandkids too. Listen Uncle Harry, I'm right in the middle of my Presidential Speech here...

...Thank you, Uncle Harry, I'm proud of you too. I just...

... No, I remember. I'm going to talk at your Senior Center. Right, the Nieces and Nephews Career Question and Answer session. I've got my notes right here [PULL FROM BINDER]

No, I won't forget. I've got it on my calendar. 8 o'clock tonight, it's right on there.

Come again? 8 o'clock this MORNING? Uncle Harry, I can't, this is my big speech as president...

...Yes, I'm proud of you too, but I'm going to have to re-sched...

...they're all sitting there waiting for me? Aunt Sally brought all her grand nieces in on the bus from New Jersey?

Hold on Uncle Harry, Let me just check how many more slides I have to show here...
[Figures 3, 4, 5, 6 – Faux slide inventory showing endless parade of boring charts]

...10, 20, 35, 90... Uncle Harry, I have a LOT of material to cover here...

[Figure 7. Resume faux data with February, 1957]

...Ok, ok, let me ask.

Folks, do you mind if I just take a minute here? We could do a little telecom with the folks at the Senior Center. I promise I'll get back to my slides.

Ok, Uncle Harry, can you put me on speaker phone? Thanks. Hello everyone... [take up notes]

...No, Thank YOU and I'm sorry about the mix-up.

I know. It says “John Kelley” in the program, but Uncle Harry called me “Jeff”.

Well, I personally think it was the powerful drugs they used in delivery rooms in the 50's.

Yes, drugs. You know, for the pain.

I think it was like this: my mother was resting in the maternity recovery ward and she's trying to figure out a nickname for her new son John Kelley –she never liked the name “Jack”. Anyway, she's mumbling my first two initials “J.F.” over and over again. “J. F. ... J.F. ... J.F. ... JF ... JF JEFF – I know! We'll call him JEFF!”. Anyway, like I said, it must've been the drugs.

...Am I famous? No, I'm afraid people in my field don't really get famous...

...Oh, Uncle Harry said that, did he? Yes, I'm proud of him too. [flip pages]

Well, ok, I guess you could say I'm famous to about 12 people who know I invented something called the Wizard of Oz approach to designing and evaluating future software applications.

...Yes, like the movie...

...Well, actually there WAS a curtain in my original simulation experiment.

Basically we were pretending that some intelligent computer program could understand what people wanted. In the early parts of the experiment we simulated the system *In Toto*...

...In Toto? Altogether? Like Dorothy's dog? That was a joke, kind of a Latin pun...

...no sir, I guess we're not in Kansas anymore. What's that? Oh, you're FROM Kansas...

...Uncle Harry, help me out here.

...What's that? Yes, I work at IBM. Thank you for asking. [flip pages]

I'm an outbound consultant with about 40 colleagues in IBM's Usability Engineering Practice...

...excuse me? You think you have Lumbago? No, no, it's not a medical practice...

Well, yes many of us have our doctorates, but we're not that kind of doctors.

We're a *consulting* practice. We represent the user experience on application development projects. This covers a range of activities when new products are designed and built.

The most visible aspect of what we do is the visual design of screens and controls that are *usable* and *accessible*.

Behind the scenes, we are active participants from the beginnings of a project: [\[count on fingers\]](#)

1. we help to establish requirements that match the business model to the end-user's functional needs
2. we define the information and user interface architectures,
3. we use iterative user-centered design techniques to establish a solid conceptual navigational model,
4. we write style guides,
5. we help inform decisions about platform and delivery, and much, much more

There are dozens of different work products we contribute to various projects.

Usability Engineering is a subset of Human Factors and Ergonomics...

...sure you can go to school for that.

I have a bachelor's in Human Factors, Masters degrees in Ergonomics and Experimental Psychology and a Ph.D. in Engineering Psychology...

...Your husband does what in his pajamas? No, I'm sorry ma'am, I'm not that kind of psychologist. It's ENGINEERING Psychology...

...I know, not many people have. I certainly had never heard of it when I went to school...

How did I learn about it? I have a story about that here somewhere... [\[flip pages\]](#)

It all started when I was doing my undergraduate work at UC Santa Barbara, where I managed to squeeze 4 years of undergraduate work into 7...

...Yeah, I know. Well, the campus was right on the beach.

Anyway, I guess it's fair to say that I had a lot of difficulty finding a major. I tried Pre-Med and liked the physiology and anatomy labs, but I didn't really want to be a surgeon or physician.

Then I tried Engineering, and ...

...Yes I had a slide rule – and later I wore a scientific calculator on my belt...

...No, that's ok Uncle Harry, I WAS kind of a geek...

Thank you Uncle Harry, I'm proud of you too.

Anyway, I was fascinated by the physical design of things, but I didn't want to focus all my attention on bridges or electronic circuits or inanimate objects for a living.

I declared Psychology and loved the experimental methodology and theories of cognition and skill acquisition, but I couldn't see myself in a clinical practice...

...Yes, ma'am, I suppose that would have come in handy. Tell you what, just have your husband call me and I'll see if I can find someone for him to talk to.

Anyway, while I was bouncing around in college, I even tried Fine Arts and Music majors. I loved design and drafting and I spent many long hours noodling the keyboard in the rehearsal rooms, but it was quite evident to me **and** my various professors that I wasn't cut out to be an artist or a musician!

...Yes, I finally did graduate, I'm happy to say. [flip pages]

My student advisor was a former marine master-sergeant and a truly remarkable person. One day she and I were going over my checkered academic career – some classes I did very well in, but others ... well, not so much.

In fact, we were just beginning to wonder if I was cut out to be a college student *at all* when her secretary walks by her office and says “Janet, they’ve just announced a new major called Human Factors” and she drops a flyer into Janet’s inbox and -- I swear this is true -- a waft of a breeze caught it and it, literally, dropped into my lap.

I looked at it and said “Janet, Look at this! These course requirements are all the same types of classes that I’ve loved and done well in!”

This field of Human Factors and Ergonomics was all about designing technology so that it matches the capabilities, comfort and interests of the humans who use the technology.

Needless to say, I’d finally found my major -- and the net result was that I blossomed from a future college dropout to a dean’s list graduate with a scholarship to Johns Hopkins. That’s where I earned my Ph.D. from the man I have come to describe as the “godfather of Human Factors”, the late, great Alphonse Chapanis.

...I know, it was a terrific loss.

Al was a genteel man with a passionate dedication to his students and to the main work of the Human Factors field, which I’d describe as improving the quality of life on our planet by reducing the frustrations we all encounter working with technology and things designed by people.

In the course of his illustrious career, Professor Chapanis had opportunities to make a dramatic impact and save lives. An example is his early work during world war II -- work that pretty much kicked off the whole field of Human Factors.

It was 1943 and then-Lt. Alphonse Chapanis was a psychologist at Wright Field. He was asked to investigate the high incidence of quote-*pilot error*-unquote in aviation training and combat accident reports.

To be specific, pilots of P-47's, B-17's, and B-25's were frequently causing crashes by retracting the landing gear of their aircraft instead of setting the flaps while taxiing. Chapanis did some observational studies and concluded that the side-by-side arrangement of the two controls, combined with the nearly identical shape of the controls were leading tired pilots into making this error.

He introduced the principle of "shape-coding" to solve this problem. The quick wartime fix to glue a small model wheel to one lever and a wing-shaped wedge to the other.

This, I thought, was pretty cool, but couldn’t really see myself having those kinds of opportunities since my interests at the time were more in the areas of telecommunications and computers.

What’s that? How would someone like Chapanis “improve the quality of life” in an area like communications and computers?

That’s what *I* was wondering. [\[flip pages\]](#)

When I was offered the NSF Fellowship to go work on my Ph.D. with Professor Chapanis, I decided to do a little digging -- find out more about this guy who apparently had so much to do with defining Human Factors.

One day, while cruising the dustier section of the stacks in the library, I ran across this little study that The Professor had done back in the 1950's.

He was consulting for an electronics company designing a new numeric keypad for this switching device and he did an experiment comparing different arrangements for the buttons.

He found that people performed a teensy bit better using one layout than the other. We're talking 2 or 3 percent.

When I first read it, I was thinking "2 or 3 percent improvement? That's not much of an impact"...

...Exactly! Not like saving lives in aircraft design.

But I'll tell you what: later on, when I got home, I got to thinking about that little study.

You see, the electronics company he was consulting for was Bell Labs, the switching device was - The Phone System, and the keypad was the push-button phone that they were developing to replace the old dial phone.

Here's an exercise for you: Think about that little bit of annoyance you get when you dial a wrong number.

Now multiply that by the 3 billion phone calls that are placed daily in the US alone and think about how much cumulative human pain and aggravation that we humans are spared because one Human Factors guy did a careful little study and came up with the right answer.

In fact, I looked it up many years later and *did the math*.

The time savings alone, when you multiply it out, could be well in excess of 48 MILLION hours per year of extra time humans DON'T have to spend dialing wrong telephone numbers (and suffering the consequences).

Most of us in our field do this.

We labor away, year after year, trying to achieve those little incremental improvements in the quality of life.

The people we serve are basically comprised of every person who uses a car or cellphone or appliance or computer or **any** piece of technology.

And, you want to know something?

Our true customers *don't do the math; most of them don't even know we exist.* ...

...What's that? Then why do we do it?

Well, it's obviously not for the recognition [\[flip pages\]](#)

I think people come to this field because they recognize an opportunity to make a difference. And that's the Pure Motivation for it.

Imagine a chance to earn a living by anonymously practicing random acts of kindness and senseless acts of beauty.

Do I really believe that my career boils down to being “kind”?

First of all, I'd call it more of a calling than a career.

And, essentially, yes.

Consider this: I'm just like anyone else when I screw up working the two-button timer of my coffee pot or can't figure out which sequence to push on my 50-button remote to switch the TV to the DVD player.

Just like most people, I think “boy, am I stupid.”

But, thanks to the influence of mentors in my life like Al Chapanis, I sometimes follow that thought with one like “Hmm, am I just stupid or is this thing really hard to figure out?”

And, if the design space for the gadget is one I have some experience with, I might say to myself “I think I've seen this kind of confusing design before,” and then you know what happens? I get provoked and start looking things up.

And then, I say to myself “Wait a minute; this is a KNOWN problem. We KNOW how to solve it. Why are they still making these bone-headed design decisions and making their poor users feel stupid???”

...hmm? Why - Do I sound angry?

Well, I'm not angry about my own loss -- I've long since given up spending the kind of energy it takes to worry about whether I'm technologically stupid or not.

Tell you what, though: I am kind of angry on behalf of the people I've dedicated my life to serving.
[flip pages]

And, I'm not so much angry at the individual engineers or programmers who placed and labeled the buttons or designed the convoluted sequences in which you have to push these buttons – they are predominantly dedicated professionals who are committed to quality in their own work. They obviously didn't know any better or they would have done it properly.

No, I'm mostly upset about the institutional ignorance and short-sightedness that perpetrates user-hostile designs on the unsuspecting public.

I think a lot of people in our field feel this way.

I also think a lot of us are frustrated in our attempts to change the commercial culture of ignorance from the top down.

Over and over again, we have to start out by educating new clients who don't understand the key concept: A proper investment in human factors, up-front in the design process, will save development dollars and pay big dividends when the product is shipped.

I say up-front because usability isn't something you can slap onto a product after it is designed and developed.

Like someone had the misfortune to reminded us recently, “if you put lipstick on a pig, it's still a pig”.

And I talk about dividends because there's a bottom-line effect from good human factors. Think about the 2-3% time savings on the use of phones and apply that to business tasks in computer applications, for example looking up a customer in a database. Some businesses are losing tens of millions of dollars without realizing it.

So, it's compelling to talk about dollars. However, I wouldn't be too quick to dismiss the harder-to-quantify aspects of aesthetics and design. Recent studies described by Don Norman have found a surprisingly strong correlation between usability and perceived beauty in software design.

...Yes sir, I am just finishing up as President of the Human Factors and Ergonomics Society. In fact I'm going to have to wrap things up here because I'm supposed to be giving...

...How did I get into this job? [flip pages]

Well, I started out back in '87 when someone I knew asked me to help out with posters on Richard Hornick's National Program Committee. Then I helped my technical group out as newsletter editor and treasurer and eventually as TG Chair. I did some different jobs in the Technical Program Committee and then chaired that committee for 5 years. Then I did a stint as Editor of Ergonomics In Design and, after working my way through as chair of COTG and participating in a few other committees within HFES, I was encouraged by a few of the Society leaders to get involved in the Executive Council.

...Yes, there are lots of great ways for younger members to get involved [beat]...

...What did I hope to accomplish as president of HFES? [flip pages]

Well, I've led a number of different not-for-profit professional and arts organizations. The challenge is that a lot of the substantive work is done by volunteers who are balancing other demands on their time.

But this is also the beauty of it: There's a reservoir of passion there that can be a tremendous engine for advancements.

My hope was that I could help people **recognize their own passion** and commitment, and then to **empower them** to exercise that in the service of the common good. To give my fellow researchers and practitioners an effective channel for their enthusiasm and eliminate unnecessary institutional obstacles.

The trick is always to do that while keeping the shared long term strategic objectives of the organization in clear view.

That's what I viewed as my principle opportunity in this job.

...Ah, that's a great question: How do you help people recognize their own passion?

Maybe one way would be to give them an outlet for telling their own story. Last year, I set up a StoryCorps booth...

...Yes, just like on NPR.

28 of my colleagues signed up to interview each other about what got them interested in Human Factors and what excites them about what they do. I just last night put the recordings up on our website: hfestorycorps.org.

If you listen to these stories, you'll find out there are some common themes that run through them. Some of which you're hearing in my own story today.

...What's that? No, I'm not angry now. Thank you for asking.

But, we do have a problem of perception and short-sighted thinking among many people who make development investment decisions. But, you know what? I have a dream about how we can correct that. [flip pages]

First of all, the top-down strategy for educating developers and decision-makers is one part of the puzzle, and we're actually making good progress with that, but it's not enough.

My dream is that we could somehow get the word out and change the way things are done from the bottom up.

If we can educate the general public about what we do and what kinds of a difference it can make, then maybe, when people get frustrated trying to work some appliance or software program, their first thought wouldn't be "Boy, am I stupid."

Maybe their first thought would be "could this have been designed better so I wouldn't be wasting my time feeling frustrated?"

Maybe the agent of change is the specter of millions of consumers leaning out their windows and yelling "I'm mad as hell and I'm not going to take bad human factors design any more!"

...yes, just like in the movie.

But all histrionics aside, it really boils down to simple economics.

If the companies who design and produce technology believe that their customers are aware of -- **and value** -- good human factors or ergonomics or usability design, they **will** invest in it.

In fact, you would probably criticize a product manager who devoted a lot of resources to user-friendly designs if there was no apparent business justification for it.

And there's the rub: if consumers like you all don't know that life with this technology could be sweeter, less frustrating and more productive, they won't know to demand it.

If they don't demand it, and the decision makers don't recognize it on their own, then there won't be a business justification for it, ergo: bad design.

However, in a just world, designing technology for ease-of-use would be something you would, as a matter of course, quantify and put on a marketing brochure and which would help differentiate your product from your competitors.

So, what's the key to a just world? An educated consumer...

...What would *I* say if I were able to "Educate" some consumers? [flip pages]

I'd say:

Consumers: listen up. Do you care about bad design that makes you feel stupid or frustrates you or causes you to waste your precious time? Then do something about it. You're the only one who can.

Find out what "Human Factors" and "Ergonomics" means. Look up "Usability" on the web. Make these terms a part of your vocabulary. Watch for references to these things in the reviews for products you are considering purchasing. Let the winners know why you chose them. And let the losers know why you chose the winners. And if some gadget frustrates you, remember: it's not your fault -- and give 'em hell!

There are thousands of dedicated professionals out there who are trained and motivated to solve this problem, but it's got to come from you.

...Yes you can. Ask my mom; she and I just talked about it and she'll show you how.

I want to thank you all there at the Senior Center and I want to thank Uncle Harry for inviting me to talk to you all, sorry it was by cellphone.

...no, I don't think the folks here at the convention center minded too much that I couldn't get through my slides. [beat]

I would just like to leave both groups with this closing thought.

At the end of his career, my mentor and inspiration, Alphonse Chapanis wrote a memoir which ended with these words: [read from page]

"There is one thing I have never regretted - and that is my choice of profession. Human factors has always been challenging, frustrating at times, rewarding at others, but never dull.

I can honestly say in retrospect that I have had a full life - an exciting life - and that I have enjoyed telling people about human factors, educating students and others to take over where I have had to leave off, and grappling with problems of trying to make our material world safer, more comfortable, and easier to cope with.


In fact, there is only one thing I truly regret - I'm sorry I've come to the end."
[put down page]

Wow. I'll tell you what. At the end of MY career, I'd be able to retire a happy man if I had earned the right to say: "by applying what I know, I've left some small corner of the world a teensy bit more of a congenial place to live in".

[Figure 8. Closing slide] [sit down]

Note: Portions of this conversation echoes thoughts expressed by the interviewee, John F. ("Jeff") Kelley during a StoryCorps interview recorded at the Human Factors and Ergonomics Society's Annual Meeting in Baltimore in October of 2007.

Appendix: Faux powerpoint slides



**HFES Presidential Address:
50 Years of Strategic Initiatives in
HFES Science and Practice**
(broken down by month)

John F. (“Jeff”) Kelley
2008 Annual Meeting, NYC

Figure 1. Title

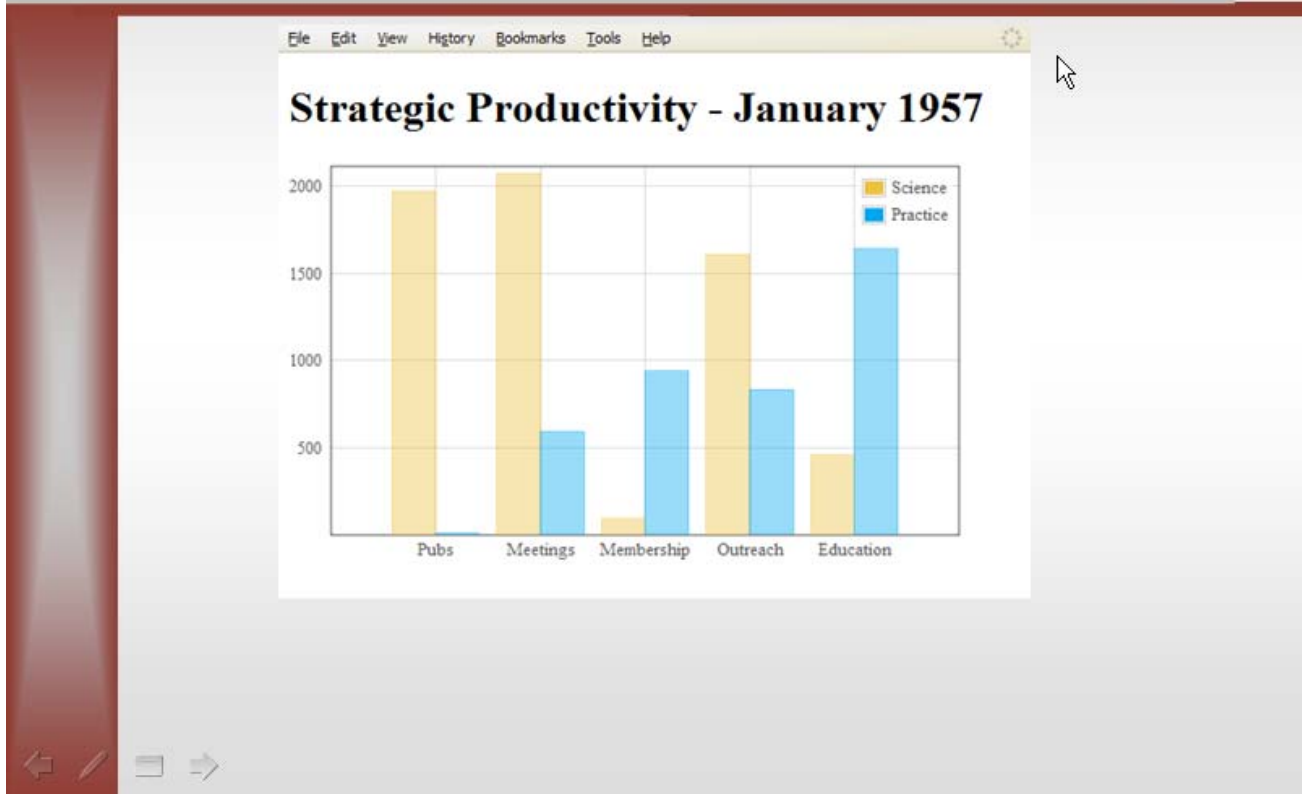


Figure 2. Faux data, Jan 1957

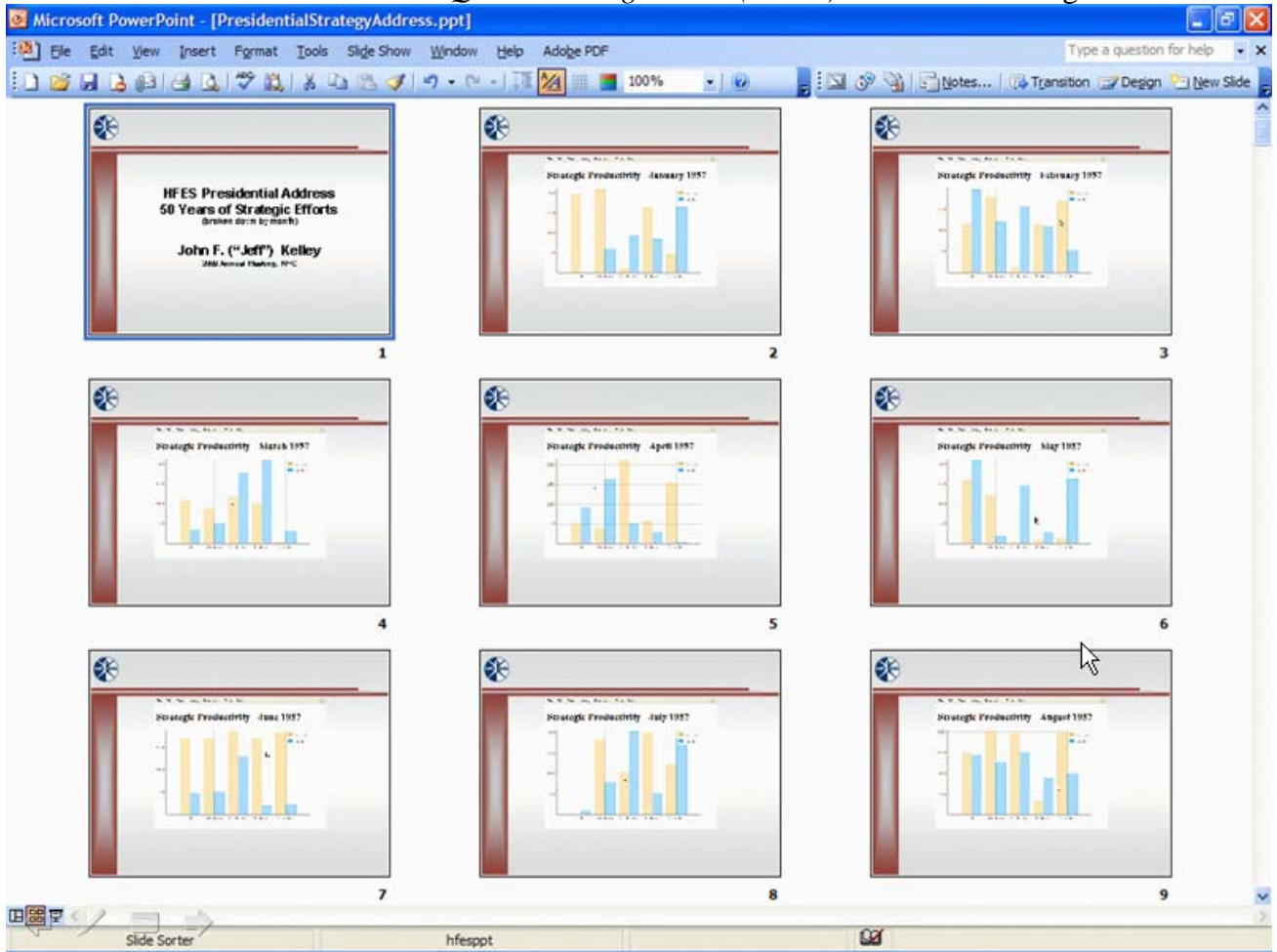


Figure 3. Faux slide inventory, part 1 of 4

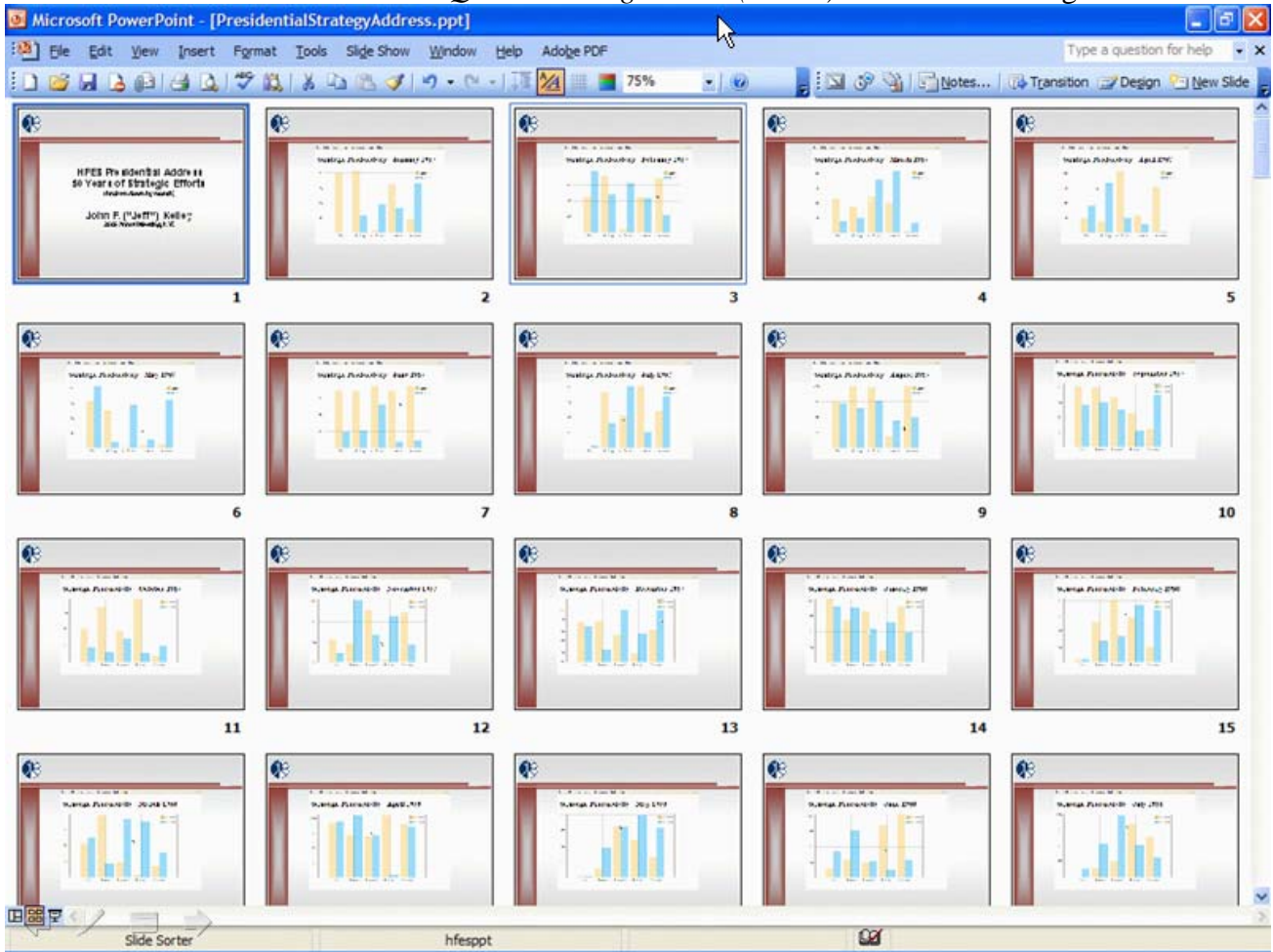


Figure 4. Faux slide inventory, part 2 of 4

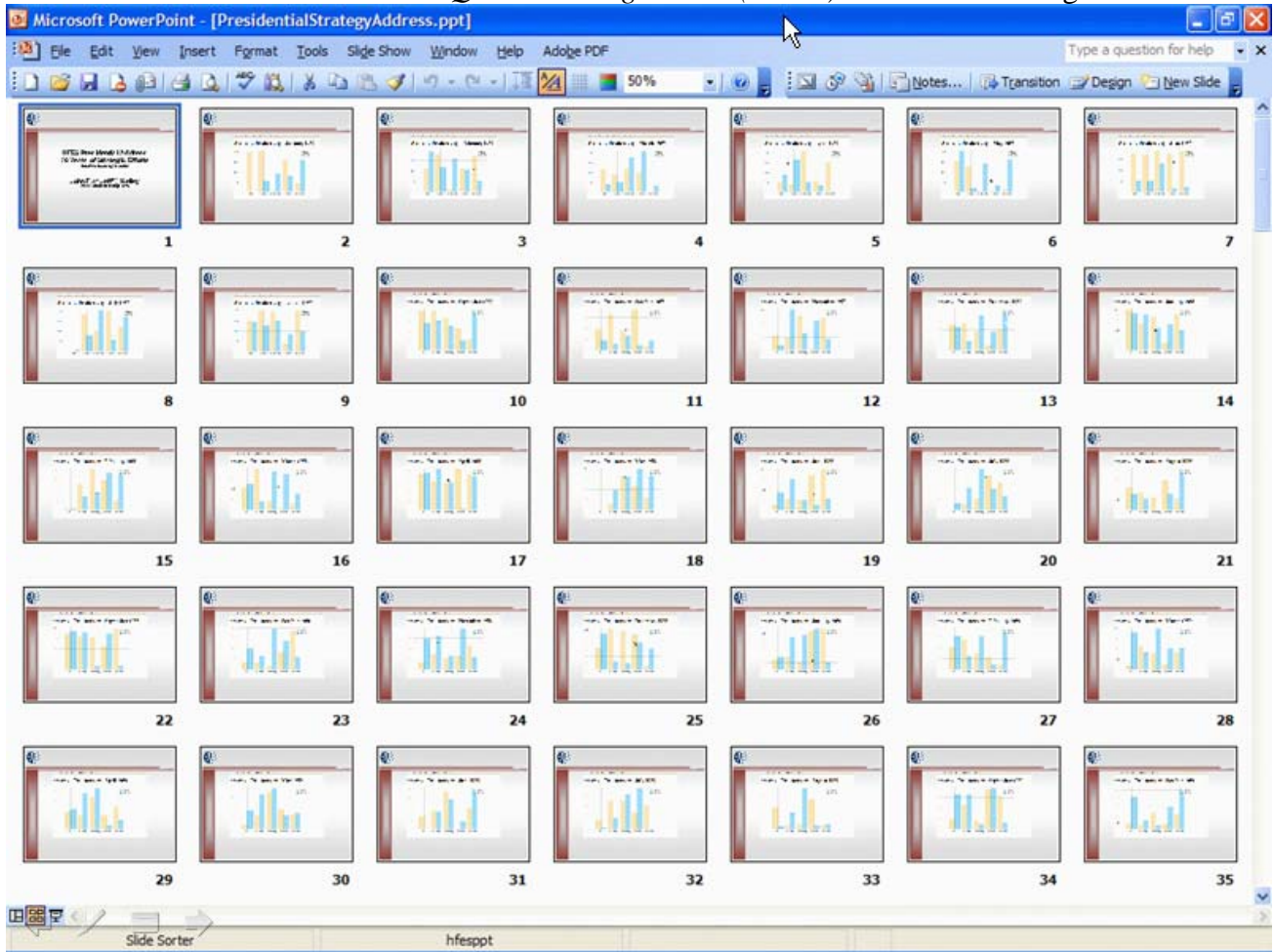


Figure 5. Faux slide inventory, part 3 of 4

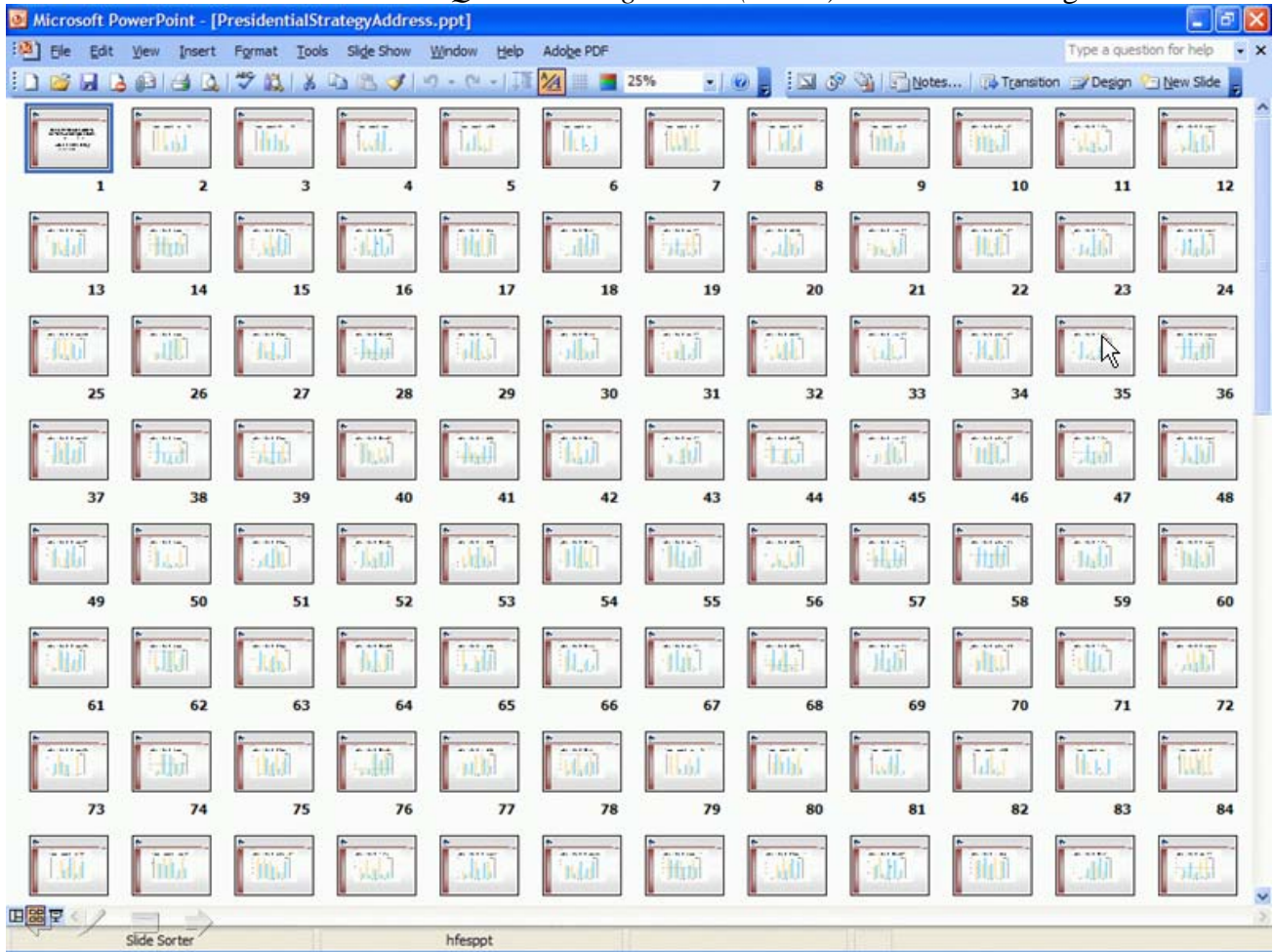


Figure 6. Faux slide inventory, part 4 of 4

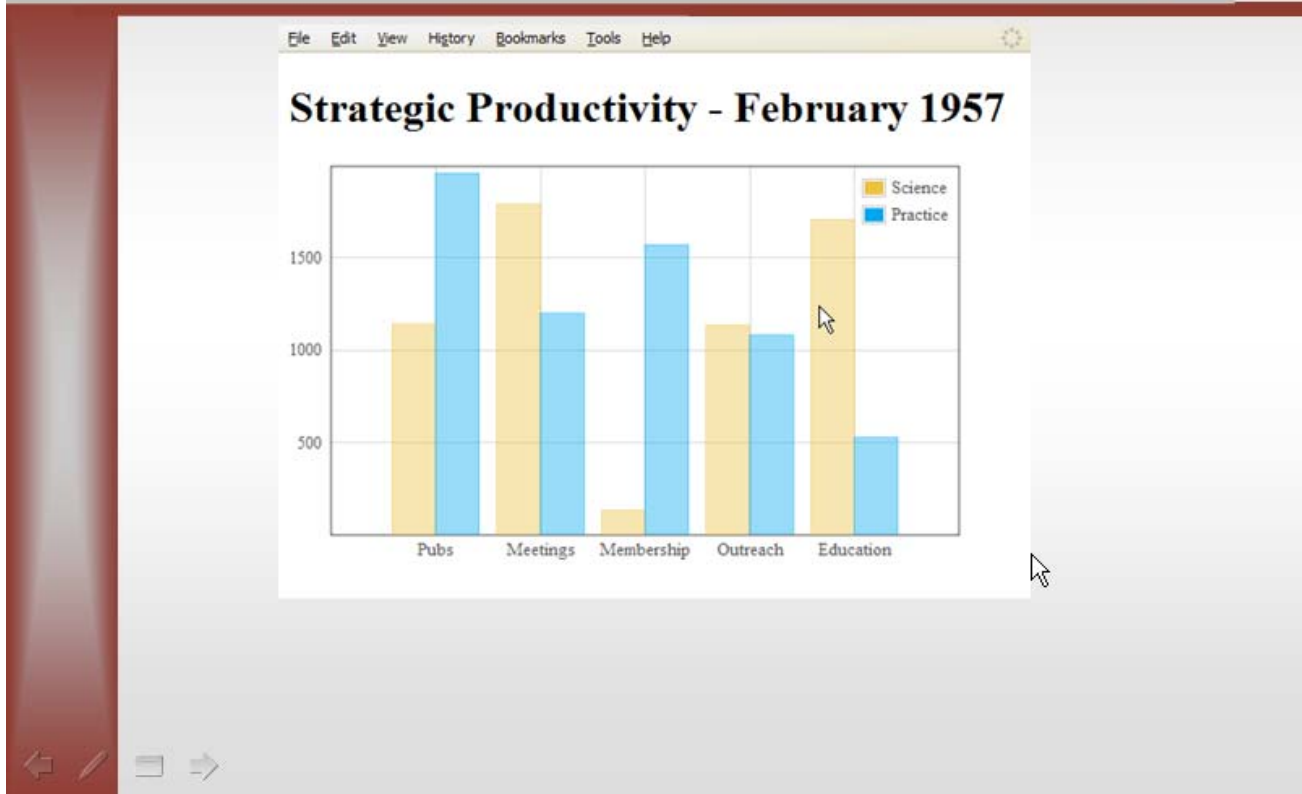


Figure 7. Faux data slide, February 1957



Thanks

- **HFES Staff, including Stefanie Alexander and Andrea Tomcsanyi**
- **Carlos de Falla, our Director of Member Services for being effective and good natured to the end.**
- **Lois Smith, our Communications Director, for her patience and outstanding (and high profile) work.**
- **Lynn Strother, our Executive Director, who really holds the Society (and the President's sanity) together with wisdom, humor and acumen.**

References:

www.hfestorycorps.org

www.ergowizard.com

Figure 8. Last slide.

www.hfestorycorps.org

www.ergowizard.com



Credits

Post-Production:

<http://MusicMan.net>

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