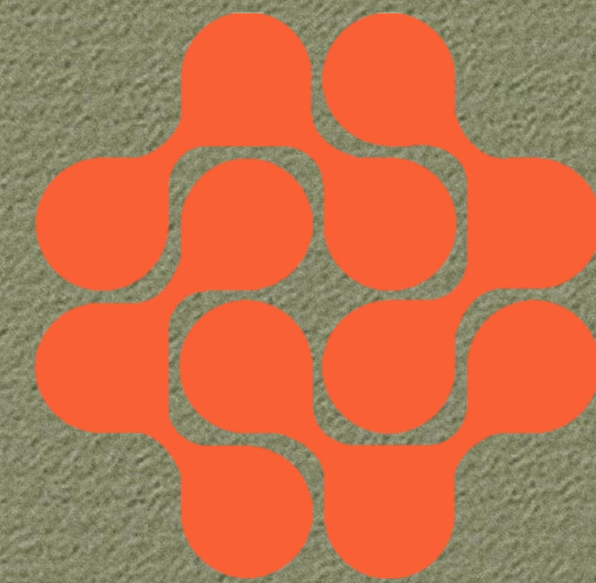


CAN AI BE AN EFFECTIVE MEMBER OF A USER INTERFACE DESIGN TEAM?

A “GEEZER LECTURE” @
BOYE & CO, AARHUS 24
NOVEMBER 2024



BEBO WHITE
BEBOAC@PM.ME



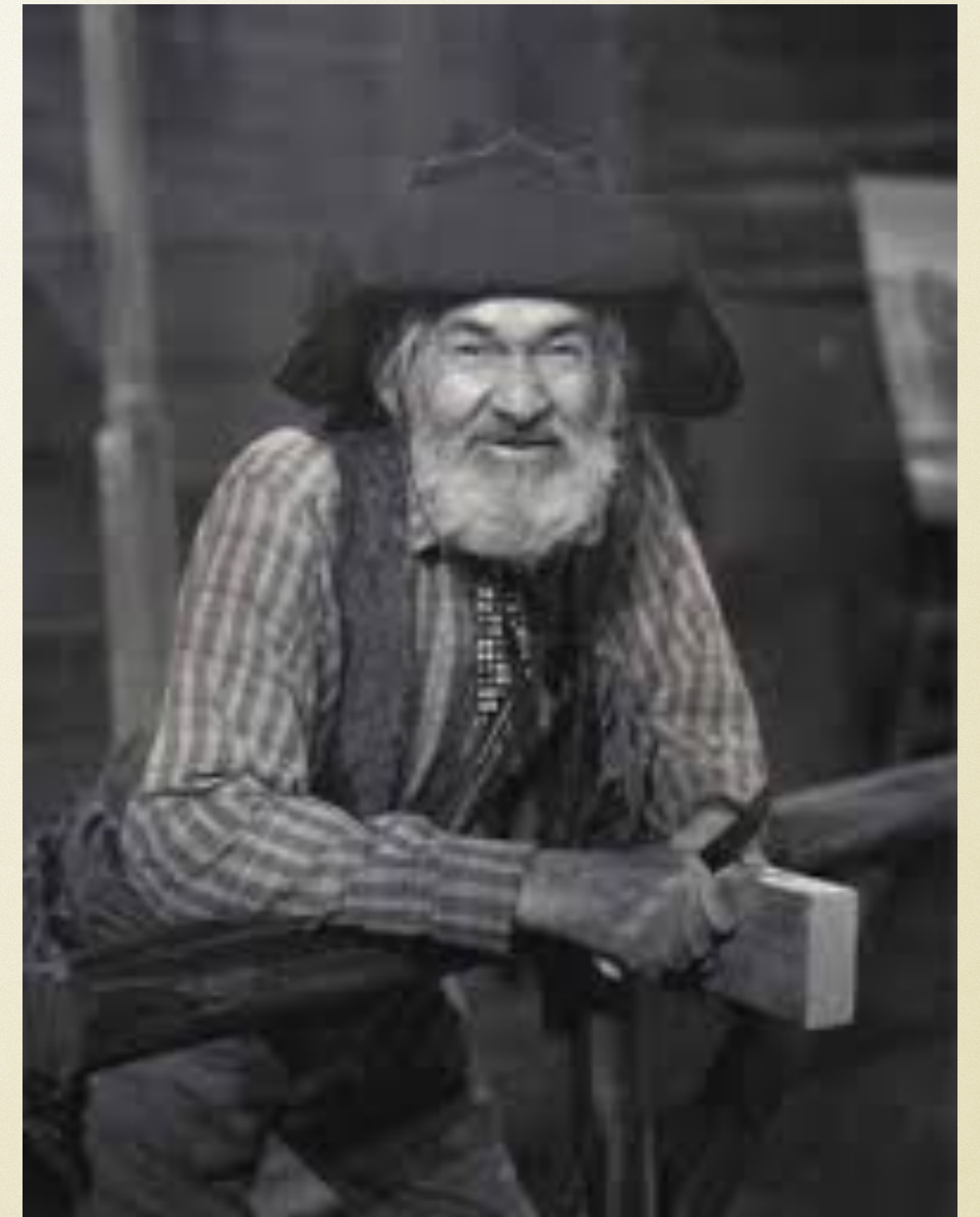
BOYE & CO

“GEEZER?”

- **Janus may remember this-**
- The Web Accessibility Initiative (W4A) holds a joint conference with the International Web Conference
- Since the 2010 conference, they have had a “*Geezer Lecture*” - I did it in 2011
- The concept has been picked up by other conferences (mainly in computer science/Internet as the early practitioners in that field grow older/mature)
- So this is the inaugural (?) “*Boye & Co. Geezer Lecture*”

FIRST, WHAT IS A “GEEZER?”

- *“A cranky old man carrying the connotation of either age or eccentricity”*
- *“A curmudgeon”*
- *“A side-kick to the hero in classic Western cowboy movies”*
- *“Someone who likes to share the benefits of age”* (Bebo)
- *“Geezers are also known to sometimes ramble on in their stories”* (Bebo)



“The rate at which a person can mature is directly proportional to the embarrassment he can tolerate.”

-Doug Engelbart

“Geezers have to learn to accept embarrassment!”

-Bebo

THE PATH TO AARHUS 2024

50+ YEARS AGO THIS “GEEZER” TOOK HIS FIRST COURSE IN COMPUTING

- “Numerical Techniques in Physics” - required for a physics major - University of North Carolina
- Programming in FORTRAN
- Punched cards (which students had to punch!), paper tapes, long wait times, massive printouts, no debuggers - all the stereotypes of “ancient computing”
- I hated it and saw no future for me with computers! - Denmark was not a place that I dreamed of visiting...

- Physicists have a “love-hate” relationship with computing - they need it and depend upon it but would rather be “doing physics”
- It soon became clear that computing could be a partner in “doing physics” as long as communication methods can be agreed upon
- It is no coincidence that many physicists “transition” into computing because they value that relationship

OF COURSE, THE HARDWARE AND SOFTWARE GOT BETTER

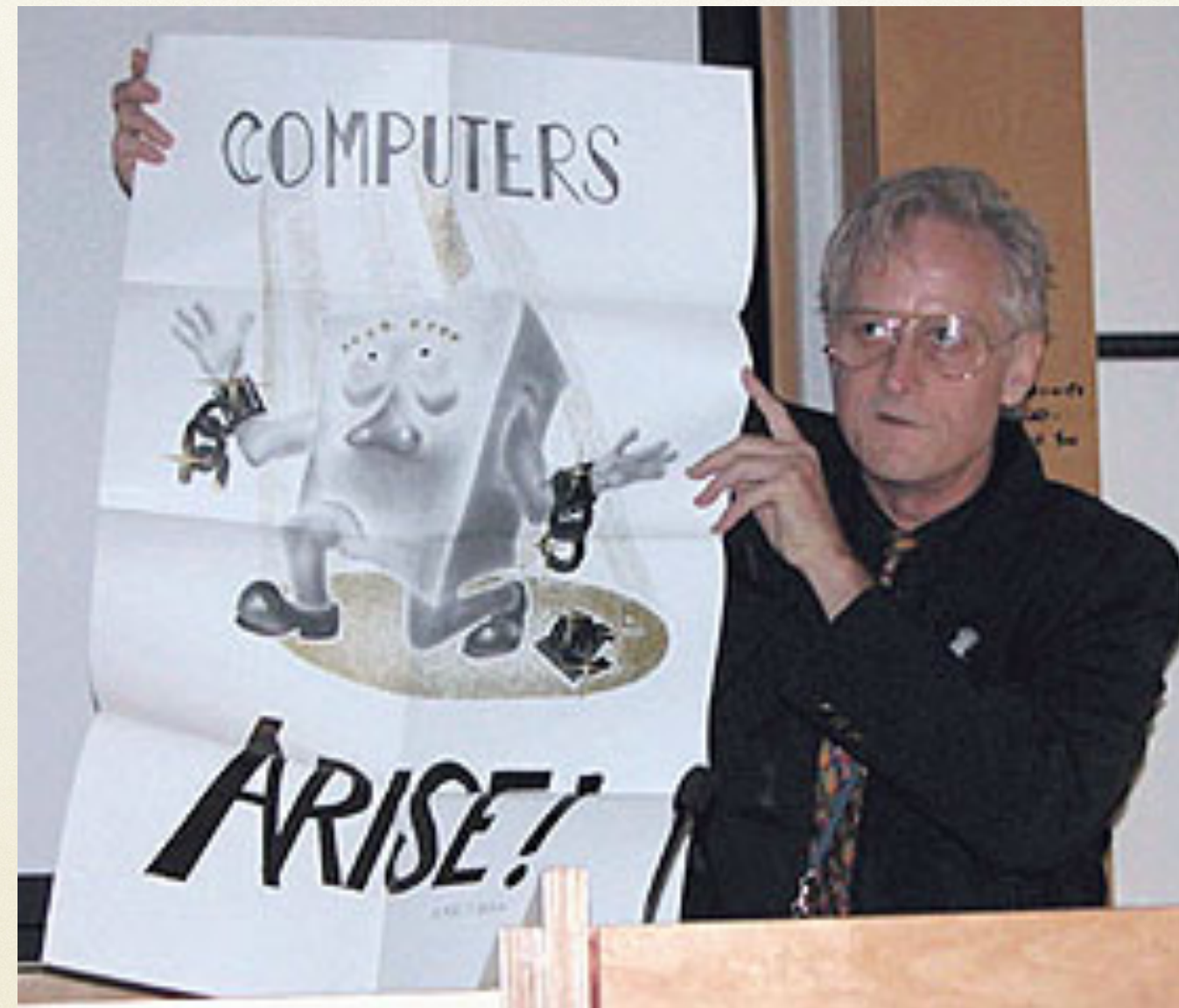
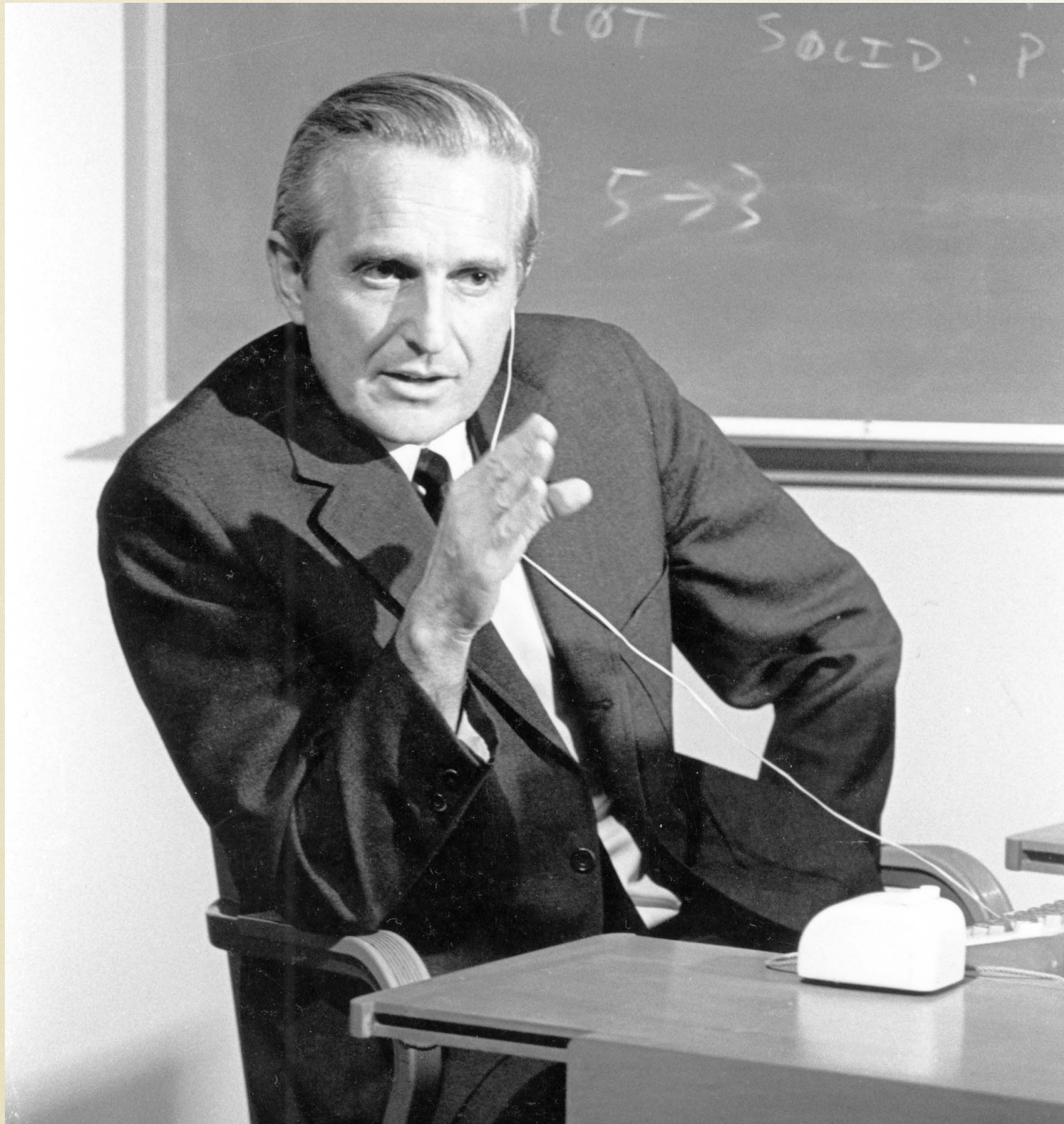
- No more teletypes or linemode terminals
- Timesharing
- Early networking (proprietary e.g., DECnet and BITnet)
- Early peripherals



**BUT IT WAS THE INTERFACES, NOT THE COMPUTERS,
THAT GRABBED ME (E.G., BEN SCHNEIDERMAN)**

- Direct manipulation interfaces
- Information visualization
- Visual interfaces to digital libraries
- “The Eight Golden Rules of Interface Design”
- Tree visualization techniques

MY FIRST “AWAKENING”

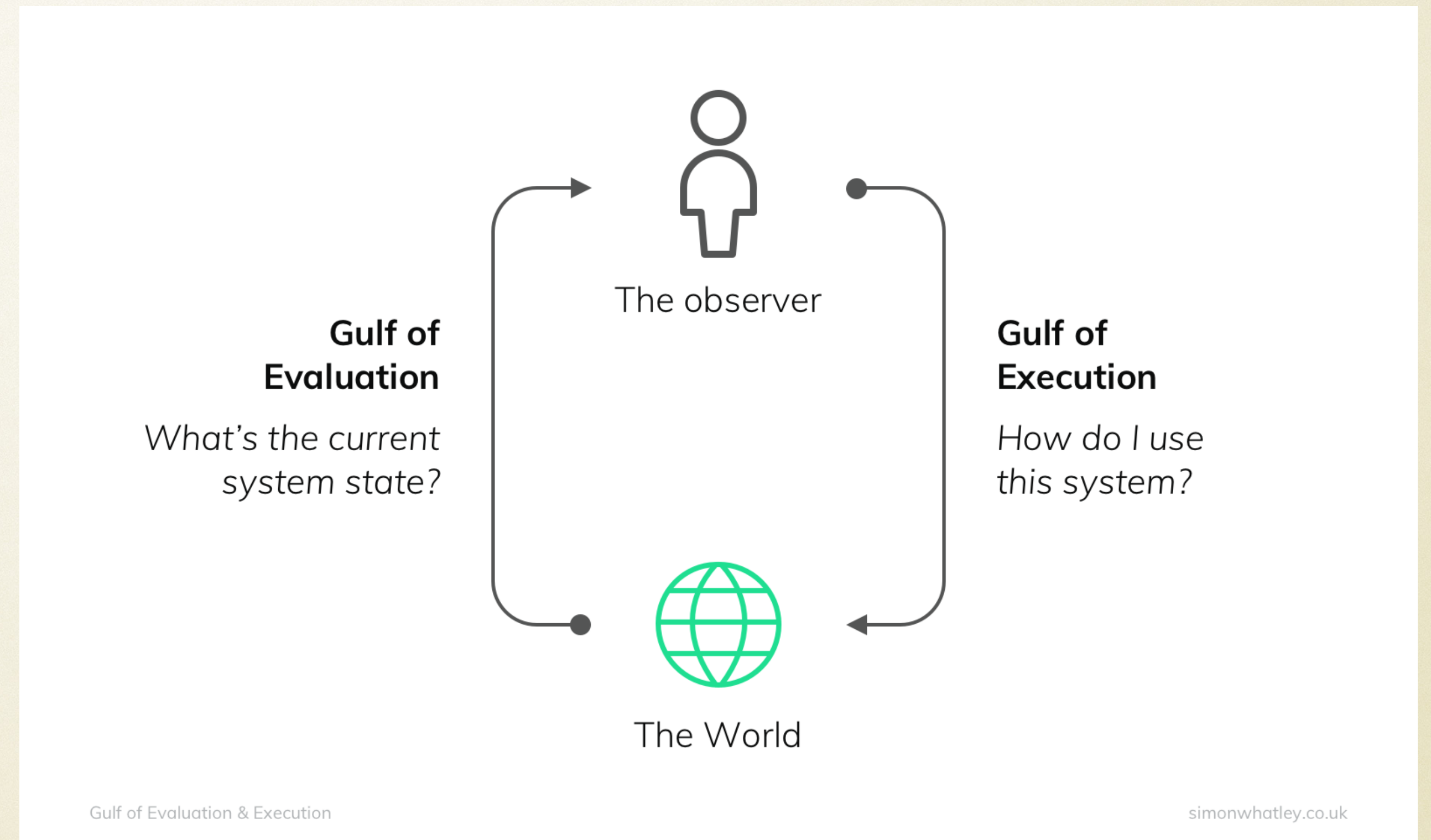
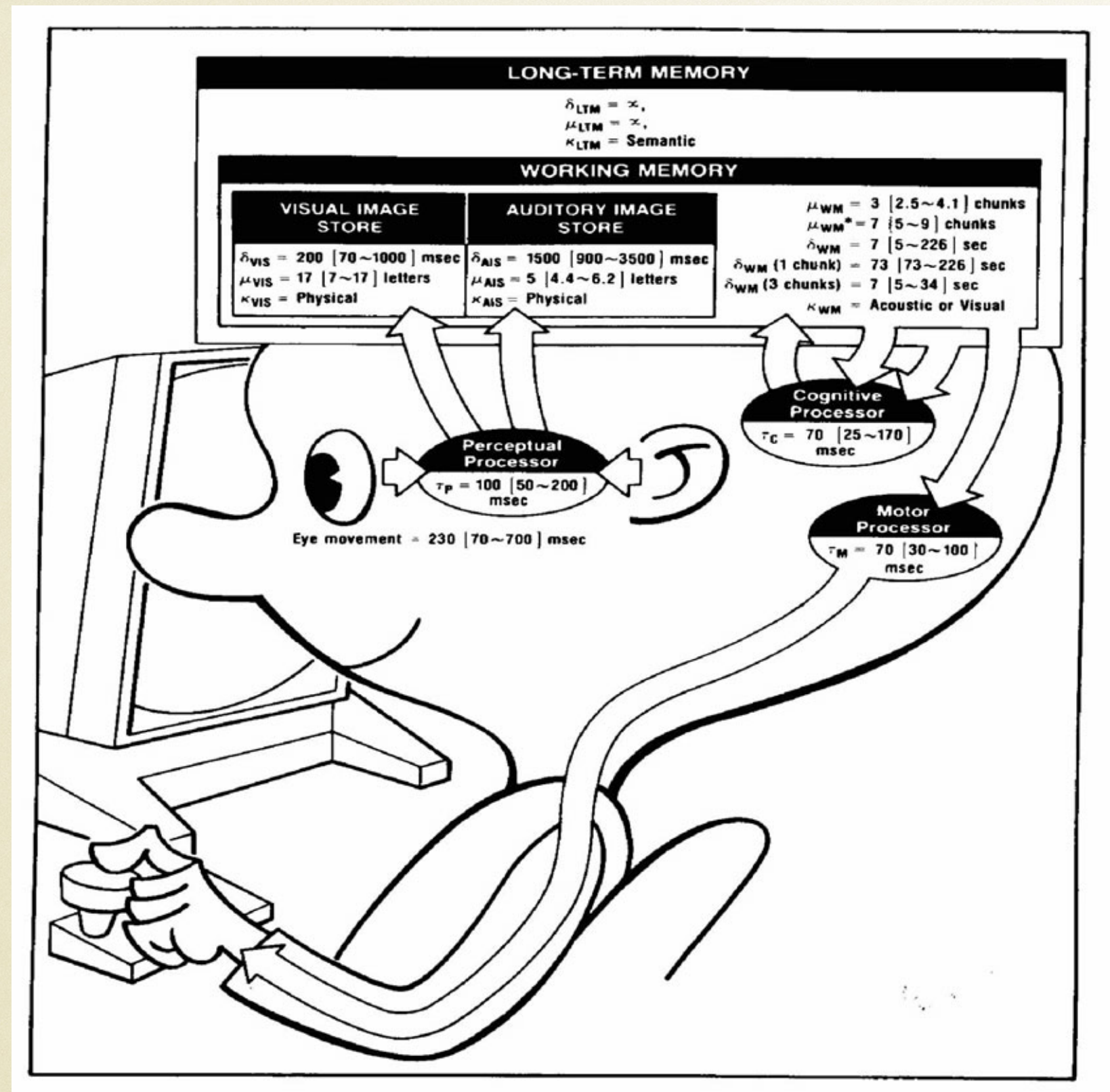


“the right place at the right time”

IT MAY BE HARD TO REALIZE NOW THAT THE EARLY WEB HAD DOUBTERS

- Concerns about misleading and incorrect information (True)
- Fears of theft of intellectual property and copyrighted materials (True)
- Fears of a “digital divide” (True)
- But these concerns did not slow adoption and social acceptance even before technologies were introduced to address them
- These doubts are remarkably similar to those expressed today re: AI

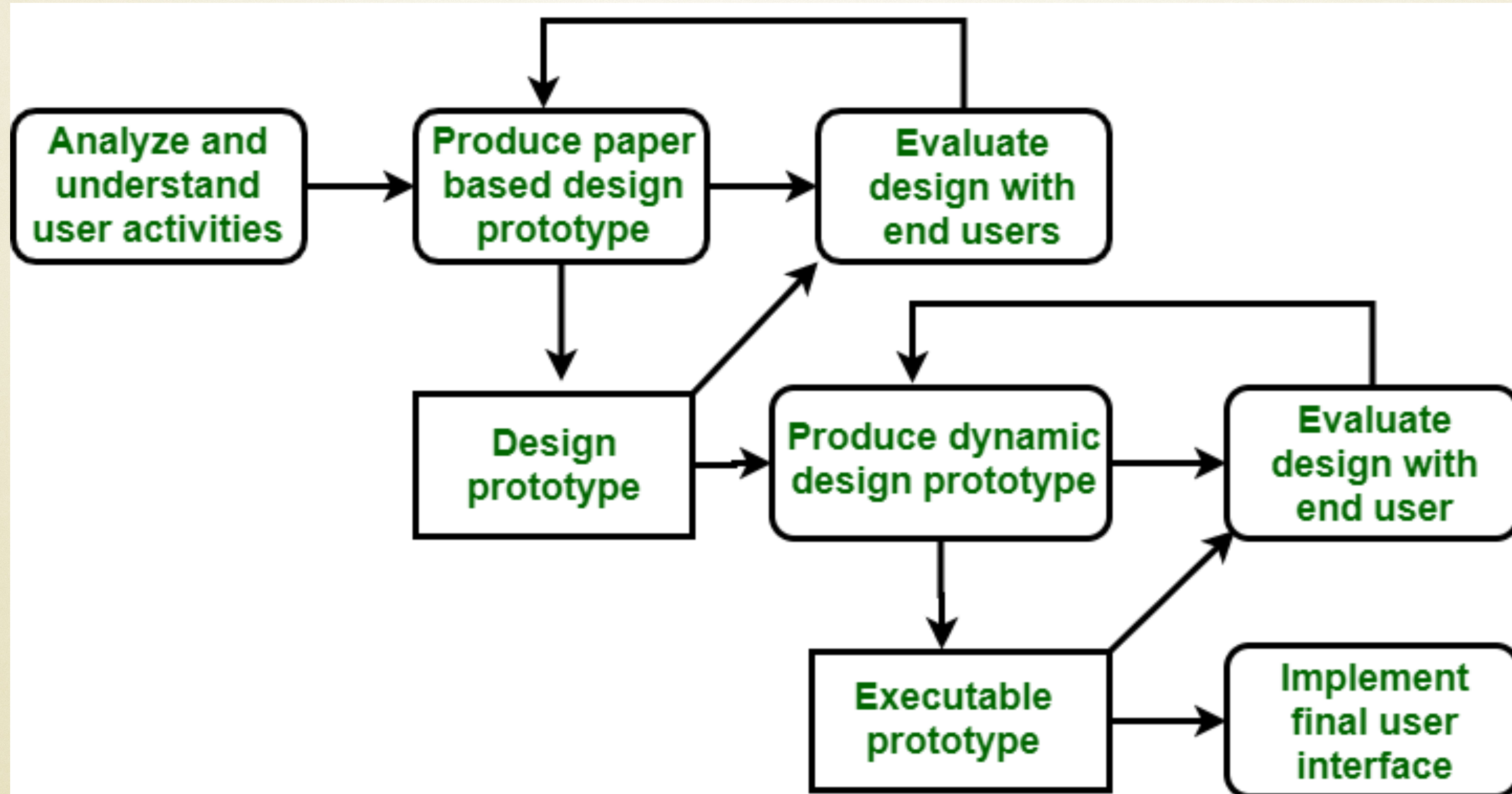
WHICH LED TO TEACHING HCI



“the Web as a metaphor for technology interfaces”

And now that metaphor is used everywhere because it is a recognized societal interaction

ALL UNDER THE GUISE OF THE (STRICT)USER INTERFACE DESIGN (UID) PROCESS



MY STUDENTS WERE FORCED TO PLAY THE (SOMETIMES
AMBIGUOUS) ROLES OF A USER INTERFACE DESIGN
TEAM

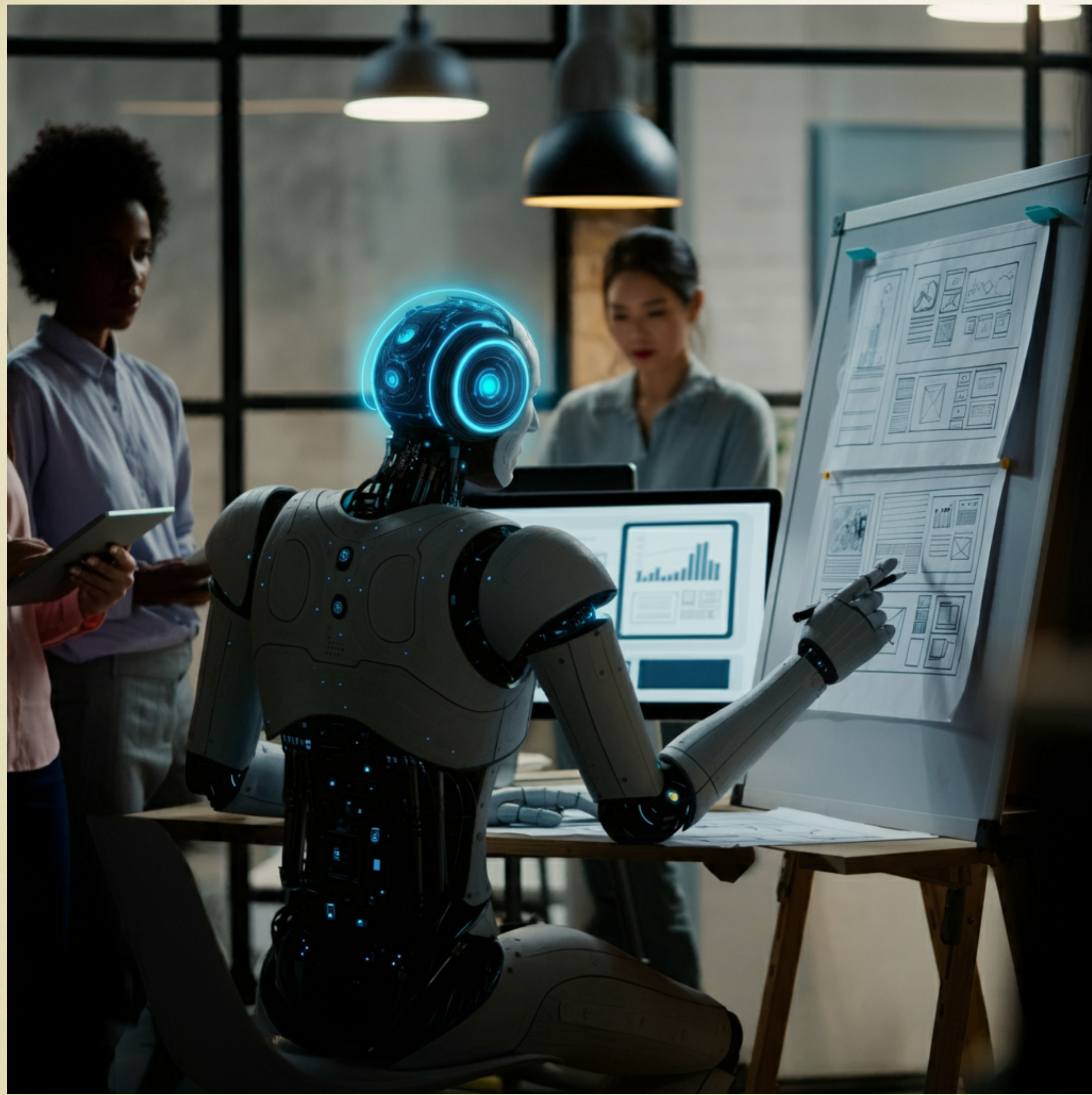
- UI/UX Designer
- UI/UX Researcher
- Information Architect
- Prototype Designer
- Testing Designer, Coordinator, Analyst
- Documentarian
- etc., etc.

AND THEN CAME “MY 3RD AWAKENING”

- Cryptocurrency and Blockchain were actually the 2nd (but that’s another story from another Boye talk...)
- *“Is Artificial Intelligence the Key to the Ultimate Human-Computer Interface?”*
(perhaps supported by other technologies, e.g., Ray Kurzweil)

bringing us to

“Can AI be an Effective Member of a User Interface Design Team?”



Designing paper prototypes



Taking notes in a usability test

WHY EVEN ASK THIS QUESTION?

- It's not just about automation, but a strategic integration into the design process
- It's not about replacing individuals, but making available new tools and new skills to them
- It's about adding a capability that is likely out of the reach of an existing team (augmenting)
- It's about optimizing and making more efficient(?) an iterative (and often tedious) process

OR ACTUALLY, IT MIGHT FUNDAMENTALLY BE A STUPID QUESTION!

- My testing examples come from GPT (and ChatGPT), one of the best known LLMs
- It has a tendency to be both confident and non-judgmental in its responses
- While some responses may be actually non-responses (which may be due to the composition of my queries), it has never actually suggested that my query was a stupid question
- Therefore, I hold out for the best outcome and or what I really want to be true based on early dreams

“By ‘augmenting human intellect’ we mean increasing the capability of a man to approach a complex problem situation, to gain comprehension to suit his particular needs, and to derive solutions to problems. Increased capability in this respect is taken to mean a mixture of the following: more-rapid comprehension, better comprehension, the possibility of gaining a useful degree of comprehension in a situation that previously was too complex, speedier solutions, better solutions, and the possibility of finding solutions to problems that before seemed insoluble.”

-Doug Engelbart, *Augmenting Human Intellect: A Conceptual Framework*, October 1962

ENGELBART SPOKE OF “COLLECTIVE IQ”

- It measures “effectiveness” of how well groups work together to anticipate and respond to problems and situations of a product, service or research goal
- It is not an abstract measure of reason but a measure of getting things done and successfully completed - complex goals need more Collective IQ
- Its components are
 - Group process - collective ability to develop, integrate and apply knowledge
 - Shared memory - gained, captured, accessed as a shared resource potentially with technology

“AI in the form of LLMs/GenAI could be an assistive technology for researching, analyzing and sorting through massive amounts of data including prior relevant works thereby adding to a Collective IQ”

-Bebo

JUST A FEW OF THE CONTRIBUTIONS (IMHO) THAT AI COULD POTENTIALLY ADD TO THE COLLECTIVE IQ OF A USER INTERFACE DESIGN EFFORT

- Unprecedented research capabilities (is it possible to remember the process before search engines?)
- Leveraging data analysis strengths, pattern recognition, prototype code generation, etc.
- Iterative design and discussion via conversational inquiries
- Persona generation for prototyping and testing
- Draft documentation support
- etc.
- Remember that UID addresses relatively narrow problems

COMPLEMENTING TEAM MEMBER CREATIVITY

- Is creativity limited to humans?
- IMHO, AI will never replace, but rather, *augment* the creativity of team members; it is *unlikely* to ever have the empathy and experience that comes from the human experience with interfaces and situations that require interfaces
- AI can “bring to the table” a new kind of *non-human creativity* - it can make mistakes, but so do humans
- Focus on the synergy between human intuition and AI-driven insights - it works for science, medicine, etc.; it helped to win the 2024 Nobel Prizes in Physics and Chemistry! (It is unlikely IMHO to ever win a Nobel Prize in Literature unless the category definition is dramatically expanded)

Create a user scenario for the design of a mobile device that does not require connectivity and can be used under low light conditions

ChatGPT said:

ChatGPT

User Scenario: Designing a Mobile Device for Low-Light and Offline Use

User Profile:

- **Name:** Sarah
- **Age:** 32
- **Occupation:** Wildlife Conservationist
- **Background:** Sarah works in remote areas with limited connectivity and often needs to record data and take photos in low-light conditions during nighttime observations of wildlife.

Scenario: Sarah is preparing for a night observation session in a remote rainforest area where cellular connectivity is unreliable. She needs a mobile device that can assist her in documenting animal behavior and environmental data without requiring an internet connection and is usable in low-light conditions.

Use Case Steps:

1. Device Preparation:

- Sarah unpacks her mobile device, a ruggedized handheld unit designed specifically for outdoor use. It's equipped with a robust battery life and is resistant to water and dust, ensuring reliability in harsh conditions.

2. Offline Capabilities:

- Without internet access, Sarah opens the device and navigates to her preferred app designed for wildlife observation. The app allows her to input data such as GPS coordinates, animal species observed, and behavior patterns.

3. Low-Light Interface:

- As night falls, Sarah adjusts the device settings to activate its low-light mode. The interface adapts with larger icons and a dark color scheme to minimize glare and preserve night vision.

4. Photography and Documentation:

- Using the device's integrated night vision camera and infrared sensors, Sarah captures high-resolution photos and videos of nocturnal wildlife without disturbing them. The camera's interface provides clear prompts for adjusting exposure and focus settings in low-light conditions.

5. Data Logging and Storage:

- Throughout the observation session, Sarah logs real-time data on the device, including environmental conditions like temperature and humidity. The device automatically syncs data with offline storage, ensuring no information is lost even if connectivity is temporarily unavailable.

6. Review and Analysis:

- After completing her observation, Sarah reviews the recorded data and multimedia content on the device's screen. The intuitive user interface allows her to annotate photos, tag specific observations, and export comprehensive reports in PDF format for further analysis back at the research station.

7. End of Use:

- Sarah securely stores the device in its protective case, ensuring it's ready for the next field excursion. The device's durable design and offline capabilities have proven essential for her research, offering reliable performance in challenging outdoor environments.

Key Design Considerations:

- **Durability:** Ensure the device is rugged and resistant to environmental factors such as water, dust, and impact.
- **Offline Functionality:** Enable seamless offline operation for data logging, photography, and documentation.
- **Low-Light Usability:** Optimize the user interface and camera settings for efficient use in low-light conditions without compromising visibility or battery life.

By focusing on these aspects, the mobile device effectively supports Sarah's fieldwork, demonstrating its reliability and usability in demanding outdoor settings without the need for constant connectivity.

- A part of a team member's responsibility has potentially shifted
- BUT, the team member must demonstrate understanding and creativity by being able to compose a meaningful query to the AI
- Composition of such a query will leverage the relationship between the team member and the AI
- Do the details of the persona and the scenario show creativity? They were not specified in the query



ChatGPT 4o >

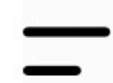


Describe a user scenario for a chatbot natural language interface that can be used underwater



In an underwater research setting, a diver equipped with a specialized tablet or waterproof device uses a natural language interface to interact with an AI assistant while conducting research on coral reefs. The diver, wearing thick gloves, can't easily type, so the chatbot uses voice recognition optimized for muffled audio through a dive mask.

The diver activates the assistant by saying, "Hey AquaBot," and can issue commands or ask questions like, "Identify this coral species" or "Log water temperature and depth here." AquaBot's responses are brief, displayed on the diver's device in large, high-contrast text for readability underwater.



ChatGPT 4o >



I'd like this to work without the need for a mask



Memory updated

For an underwater chatbot interface without a mask, we could envision a system using an underwater earpiece and a small, wrist-mounted display. Here's how it could work:

The diver wears a waterproof earpiece that transmits audio, enabling voice commands even in a submerged environment. To initiate interaction, the diver simply says, "Hey AquaBot," and issues commands like, "Log coral sample," or "Check my oxygen level."

AquaBot's responses are spoken through the earpiece, designed to be clear and audible over the sound of bubbles or other underwater noise.

ChatGPT appears so confident in its answer, "eager to please" or trying to be so creative that it would **not** respond that this is probably an unreasonable request - that would be "more human"

PARTICIPATION MODELS

- Is there a single AI that works with the design team in order to maintain consistency (such as for liability) and a historical record? (full involvement)
- Are team members encouraged (or required) to use AI clients for specific tasks? (partial and/or voluntary involvement)

AREAS THAT AI MAY EXCEL IN?

- Personalization and UX
 - Analyze user behavior in real-time, learning individual preferences and adapting UI elements dynamically
 - Recommending content based on past interaction data; adjusting interface layouts for different devices
- NLP and Voice Interfaces
 - An AI designer can easily evaluate issues with NLP interfaces
 - Could an AI team member “play the role” of an NLP interface better than a human in usability testing?

How would you redesign the web interface to The New York Times for display on an Apple watch?



Redesigning The New York Times web interface for display on an Apple Watch would require a highly condensed and simplified approach, considering the watch's small screen size and limited interaction capabilities. Here are some key considerations and suggestions for such a redesign:

1. **Focus on Key Content:** Prioritize headlines, summaries, and key information rather than full articles. Users on the watch are likely looking for quick updates rather than in-depth reading.
2. **Typography and Readability:** Use clear, legible fonts with sufficient contrast for easy readability on the small screen. Avoid small text sizes and excessive amounts of text.
3. **Visual Hierarchy:** Use a clear visual hierarchy to distinguish between different types of content (e.g., headlines, summaries, images). Utilize bold typography or color coding to differentiate sections.
4. **Navigation and Interaction:** Simplify navigation to essential sections like Top Stories, Latest News, and Favorites. Consider swipe gestures or a scrollable interface to navigate through content.
5. **Responsive Design:** Ensure the interface adapts well to the Apple Watch's round or rectangular screen shape. Test for responsiveness to ensure content is optimized for both shapes.
6. **Images and Multimedia:** Use small, optimized images sparingly to complement headlines or summaries. Avoid heavy multimedia content that could slow down loading times.
7. **Customization Options:** Provide options for users to customize their news feed preferences directly from the watch, such as selecting favorite sections or topics.
8. **Notification Integration:** Integrate with Apple Watch's notification system to deliver breaking news alerts or updates directly to the user's wrist.
9. **Accessibility:** Ensure accessibility features are implemented, such as text resizing options or voiceover support, to accommodate users with different needs.
10. **Performance Optimization:** Optimize the interface for speed and performance, considering the limited processing power and connectivity of the Apple Watch.

By focusing on these principles, a redesigned New York Times web interface for the Apple Watch can deliver a streamlined and engaging news experience tailored to the device's unique capabilities and constraints.

How would you add a voice interface to The New York Times web page?



Adding a voice interface to a web page like The New York Times involves several steps, primarily focused on integrating speech recognition and response capabilities. Here's a general approach:

1. **Speech Recognition:** Implement a library or service (like the Web Speech API or a third-party API) to recognize voice commands from users.
2. **Command Understanding:** Develop a system to interpret voice commands related to navigation (e.g., "go to homepage", "search for news on climate change").
3. **Integration with NYT Content:** Use NYT APIs to fetch relevant news articles or sections based on user requests.
4. **Text-to-Speech Output:** Convert requested content into spoken responses using a text-to-speech engine.
5. **Interface Design:** Create a user-friendly interface that indicates when the system is listening, provides feedback on recognized commands, and reads out responses clearly.
6. **Testing and Optimization:** Ensure the voice interface works across different browsers and devices, and optimize for accuracy and responsiveness.

This process involves both technical integration and user experience design to ensure a seamless and effective voice interface.

I'm not sure if there is anything new here other than a good summary
How might the query be improved?

Define a scenario where a user might want to use the New York Times website on an Apple watch



Using the New York Times website on an Apple Watch could be useful in scenarios where:

1. **News Updates on the Go:** Users can quickly glance at headlines or breaking news alerts without needing to pull out their phone or computer.
2. **Brief Reading Sessions:** When users have short periods of time (like waiting for transportation), they can catch up on summarized news articles or headlines.
3. **Real-Time Alerts:** Users can receive notifications for customized news categories or topics they are interested in, ensuring they stay informed without actively checking their phone.
4. **Reference and Quick Information:** If discussing current events or needing quick facts, users can use the watch to look up relevant articles or information from the New York Times.
5. **Hands-Free Convenience:** In situations where using a phone or computer is inconvenient or not possible (e.g., during workouts, while driving with voice commands), the watch provides a hands-free way to access news updates.

In essence, the Apple Watch integration allows users to stay connected to news updates and relevant information in a more accessible and immediate manner throughout their day.

CHALLENGES AND ETHICAL CONSIDERATIONS

- There can be no doubt that integrating can AI into UI design introduces unique challenges that may not have existed in the past
- Designers must ensure that AI-driven decisions align with user expectations and ethical standards
- Issues such as bias in underlying data and algorithmic transparency require careful consideration in order to prevent unintended consequences or discriminatory outcomes especially in real-time interactions

- Legal standards such as security and privacy could easily not be recognized by the learning models that an AI was trained with
- Inadequate “vetting” of AI-generated content could potentially impact the stakeholders of the service “behind” the interface
- Should stakeholders be made aware of AI involvement in the design process?
- **However** - are these concerns unique to AI involvement or are they just a part of UID “best practices” ?

CHALLENGES IN TEAM DYNAMICS

- It isn't well known how introduction of an AI might impact team dynamics and workflow (e.g., the Participation Models)
- What might be the key issues of potential resistance and adaptation?
- How might conflict issues be rectified?



KEY TAKEAWAYS FROM AN “OLD GEEZER”

- Changes/“awakenings” are exciting and not always recognized but usually bring new challenges
- AI (like the Web) is not going away and will only get better, more powerful and more pervasive
- Standardization/regulation of AI will drive its applications including its opportunities in interfaces
- AI (in the form of NLP) will likely become a metaphor for future UIs especially for distributed and assistive devices
- AI is not about replacing humans (e.g., in a design process) but about allowing us to explore tools, methods and techniques that were previously unavailable (we would have loved more powerful NLP interfaces decades ago but the technology just wasn't there!)
- It is our obligation to clients/customers (including the next generation) to find new and innovative ways that AI can help us (I chose UID as a part of the investigative process not worrying if it would eventually prove to be a dumb idea or might actually lead somewhere)

MANY THANKS FOR YOUR PATIENCE AND INTEREST
(FROM A GEEZER)!

THANKS TO JANUS AND TO THE STAFF OF BOYE &
COMPANY 2024 FOR YOUR HELP AND SUPPORT!

YOUR QUESTIONS AND COMMENTS ARE WELCOME
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