

Identifying Shortcomings in Data Comprehension: Advanced Technology for E-Learning Enhancement

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Introduction

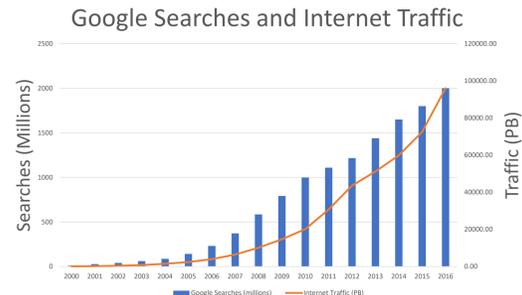
Processing information has changed over the last years

- Information flow has dramatically increased [7]
 - Virtually unlimited accumulation of data and enhanced search tools
 - More than ever, information is selected by the end user
 - Smart phones and social networks put inconceivable information in hand
- Different problems and inhibitors limit comprehension
- New technology and education is required
 - Teach end user to assess, filter and comprehend
 - Improved information systems that enhance comprehension

Background

Exponential growth in data and availability [9]

“90% data in last 2 years ... by 2025 ... grow by 10 times” Shenoy 8/8/18



Two examples [8]

Such questions from 30-50 years ago were rarely asked and more rarely answered

Today the answers are easy and just seconds away

| | |
|---|---|
| <p>How much does that house cost?</p> | <p>How long is the Nile River?</p> |
| <p>1980's Call Agent 1-2 hour</p> | <p>1960's Encyclopedia 1-2 hour</p> |
| <p>Today Check App 20-30 sec</p> | <p>Today Check App 20-30 sec</p> |

Asking the right questions is now more important than ever

Easier information flow has aggravated some old problems

- Incomplete information – “friendly apps” that show what the user “wants”
- Hidden information – Classified or secret information
- False information – deliberately incorrect data

Implications and Corrective Action

- Just having easier information flow does not mean end users comprehend better
 - For optimal comprehension, all the good questions must be asked
 - Skills must be targeted to the low-friction information environment
 - Ask better questions [4]
 - What needs to be known?
 - Get all the information [5]
 - Is “helpful” software not showing info
 - What sources should be consulted (multiple tools)
 - Recognize censorship and secrecy
 - Data classified or hidden
 - Know what is not known
 - Critically analyze reliability of data [6]
 - Is this source reliable
 - Does the source have an agenda
 - Can it be corroborated?
 - Non-trivial task taking years to complete
- Several technologies can be applied to this task.

- Teach applying critical thinking to information flow [3]
 - Avatars with AI backing



Videotaped Holocaust victim in 3D Holographic display



Animated SimCoach CGI with alternative characters

- Use constructivism to make better information flow a solvable problem
 - Effective problem solving educations using example problems [2]



Zombie Apocalypse City

- Use training simulations to hone information flow skill
 - Example augment “America’s Army” Training Game [1]



America's Army Screen Shot



America's Army Screen Shot

Conclusions

- Information flow now has less friction
 - Action is required for best comprehension
- Factors inhibit end user comprehension
- Critical thinking training can alleviate this friction
- Constructivism and other approaches hold promise.
- Simulations are training tools for information flow
- Improved information systems is future work

Author Information

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