LEARNABILITY

Paperclips and Software Tips

Peter Beshai

March 5, 2013

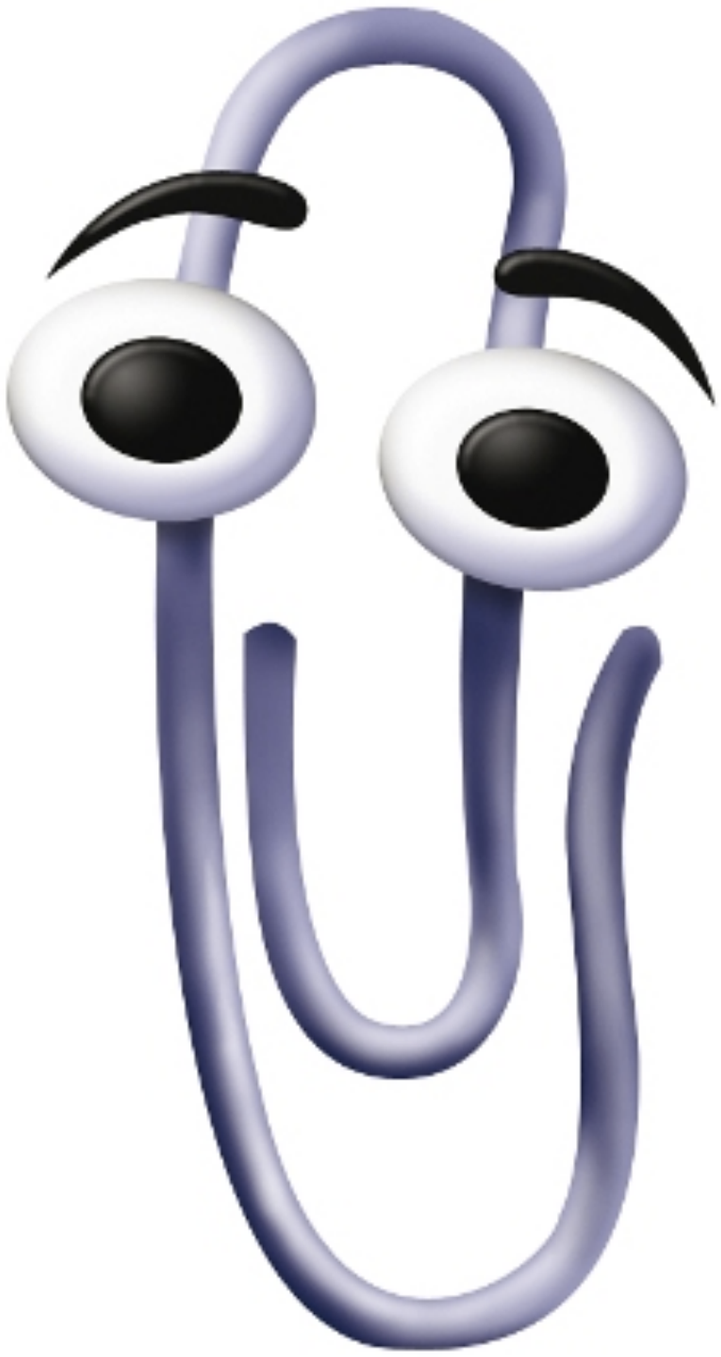


Image: Oh Internet http://ohinternet.com/Clippy

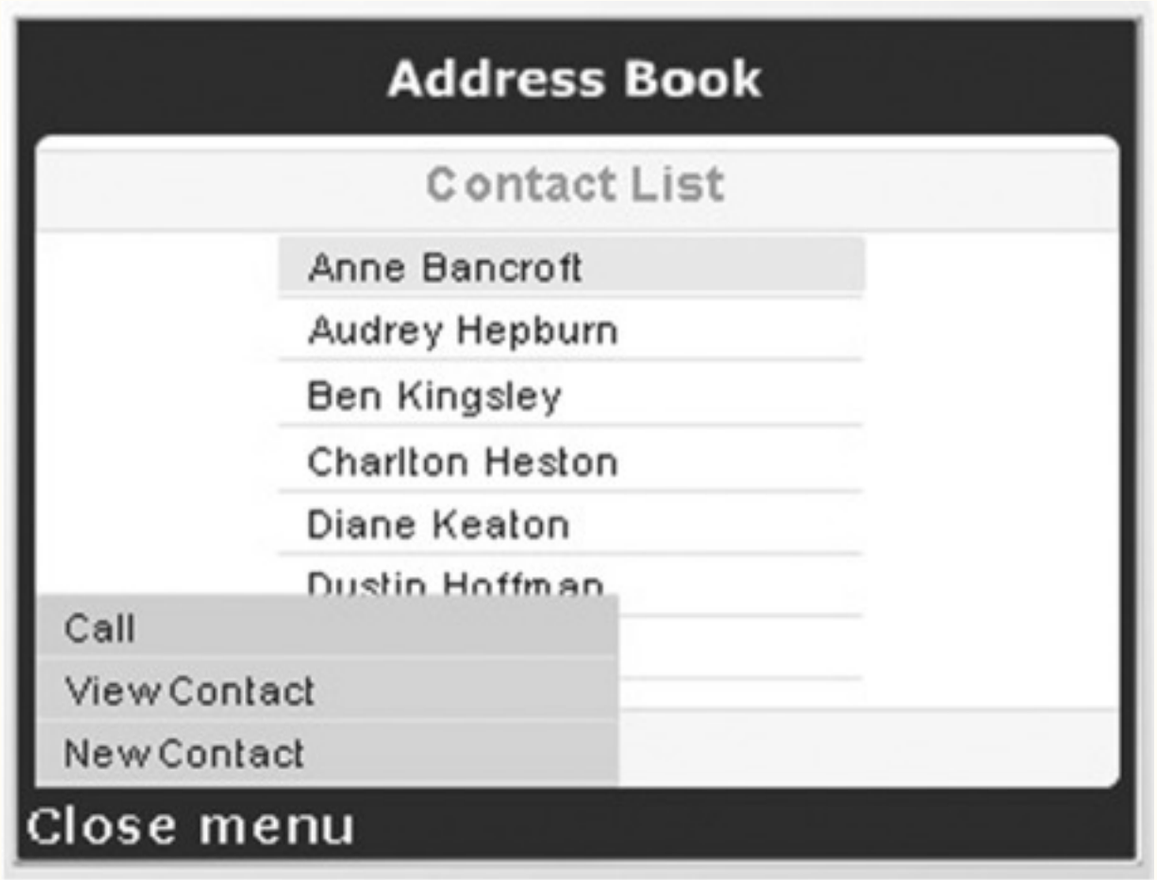
TAILORED INTERFACES

CONTEXT-AWARE HELP

COMMAND RECOMMENDING

TAILORED INTERFACES

TAILORED INTERFACES



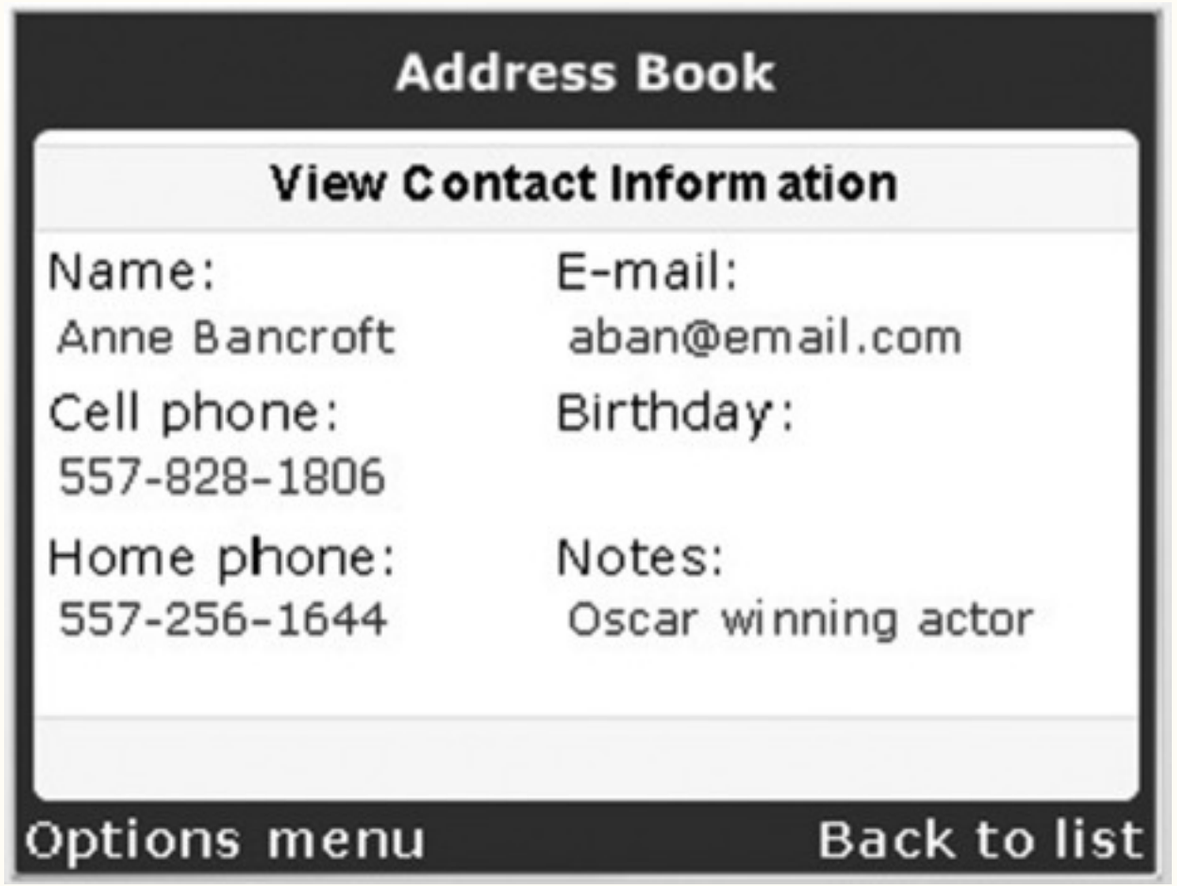
Reduced

Full

Images: [4] Leung et al., Transactions on Accessible Computing 2010

TAILORED INTERFACES

Reduced



Full

Images: [4] Leung et al., Transactions on Accessible Computing 2010

TAILORED INTERFACES

Major Results

Improved initial learnability

[1] Caroll & Carrithers 1984; [4] Leung et al. 2010

Positive transfer effects

[2] Catrambone & Carroll 1986

Major Issue

Reduced Awareness

[3] Findlater & McGrenere 2007; [5] Findlater & McGrenere 2010

TAILORED INTERFACES

Future Work

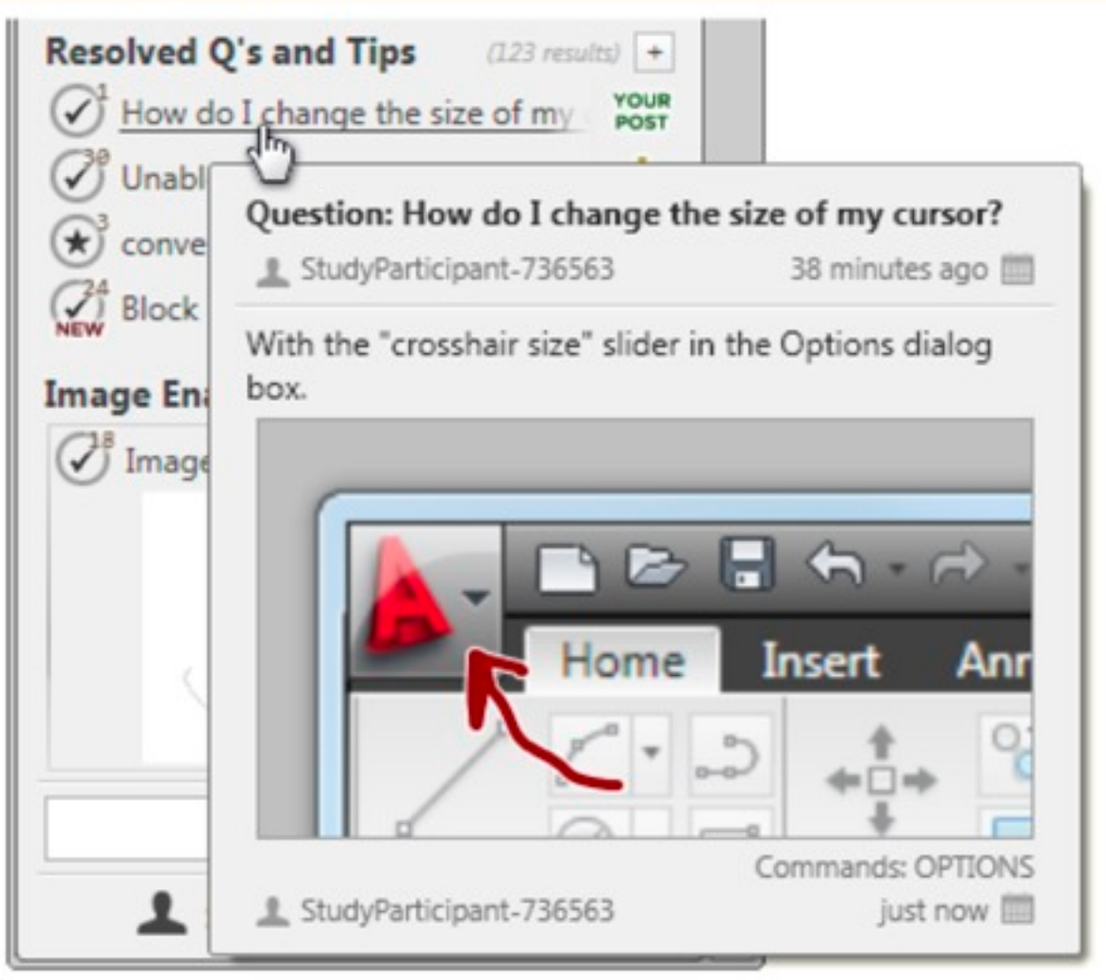
Longitudinal study

Alternate learnability metrics

Types of tasks

CONTEXT-AWARE HELP

CONTEXT-AWARE HELP



IP-QAT: In-Product Questions, Answers & Tips

[6] Matejka et al., UIST 2011

Image: [6] Matejka et al., UIST 2011

CONTEXT-AWARE HELP

Context Augmented Web Search

[7] Ekstrand et al., UIST 2011

Image: [7] Ekstrand et al., UIST 2011

CONTEXT-AWARE HELP

Major Results

Initial steps

Context taxonomy

Major Issues

Confusion

Privacy & Confidentiality

Content

CONTEXT-AWARE HELP

Future Work

Different contextual information

Machine-readable information

Collaborative filtering

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COMMAND

RECOMMENDING

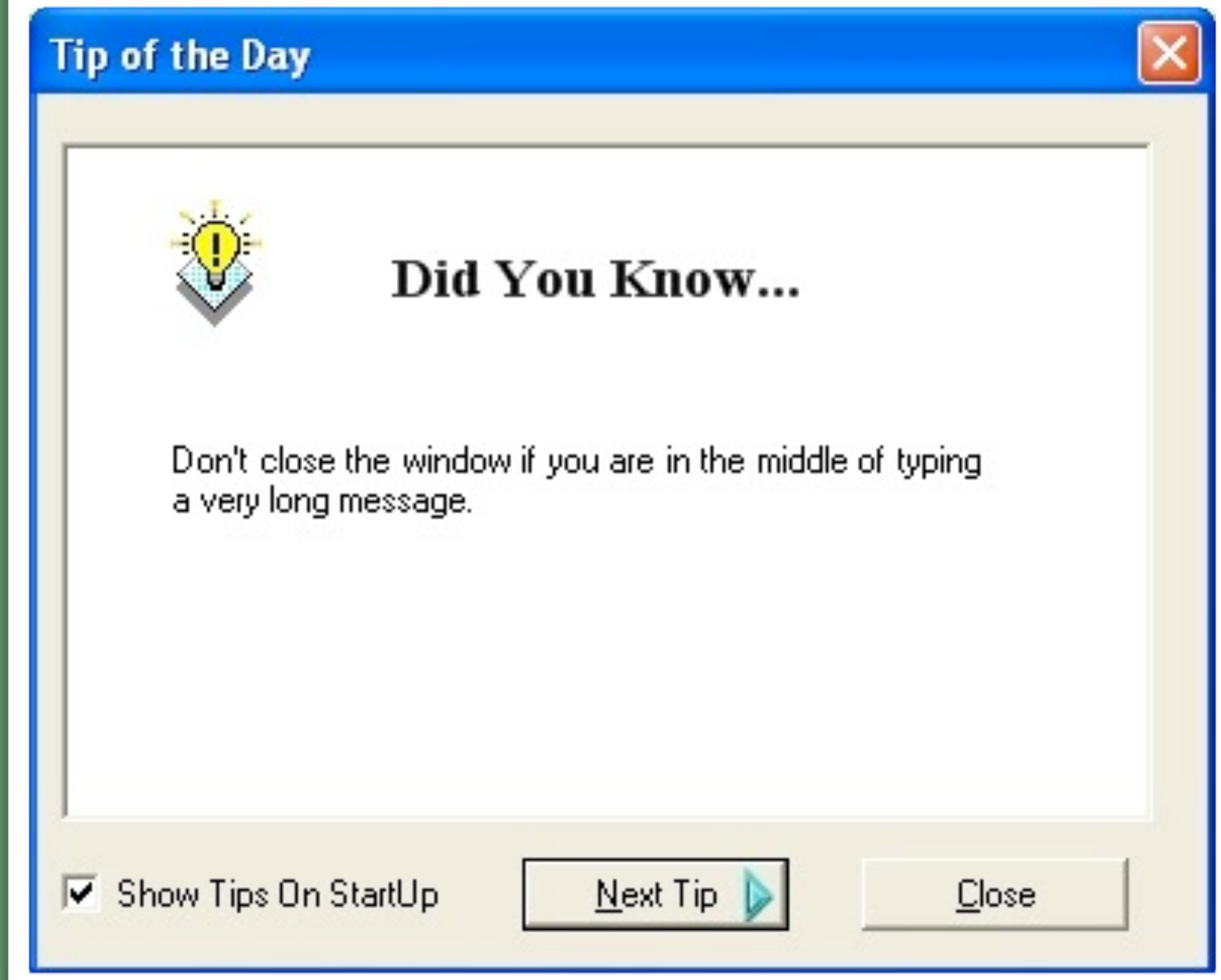

Image: C# Corner, http://c-sharpcorner.com

COMMAND RECOMMENDING

OWL: Organization-wide Learning

[8] Linton et al., Educational Technology & Society 2000

Coach by comparison to experts

Not very personalized

Intelligent Tips and Skill-O-Meter

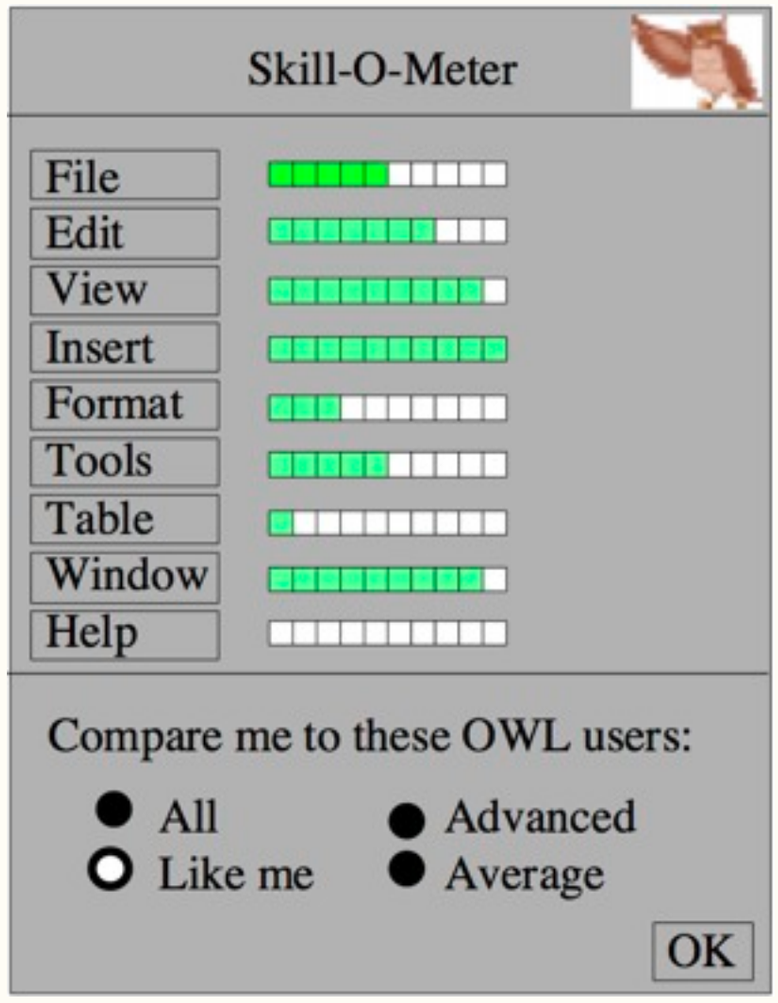

Image: [8] Linton et al., Educational Technology & Society 2000

COMMAND RECOMMENDING

CommunityCommands

[9] Matejka et al., UIST 2009

Ambient interface

Implicit rating

Personalized

Collaborative filtering

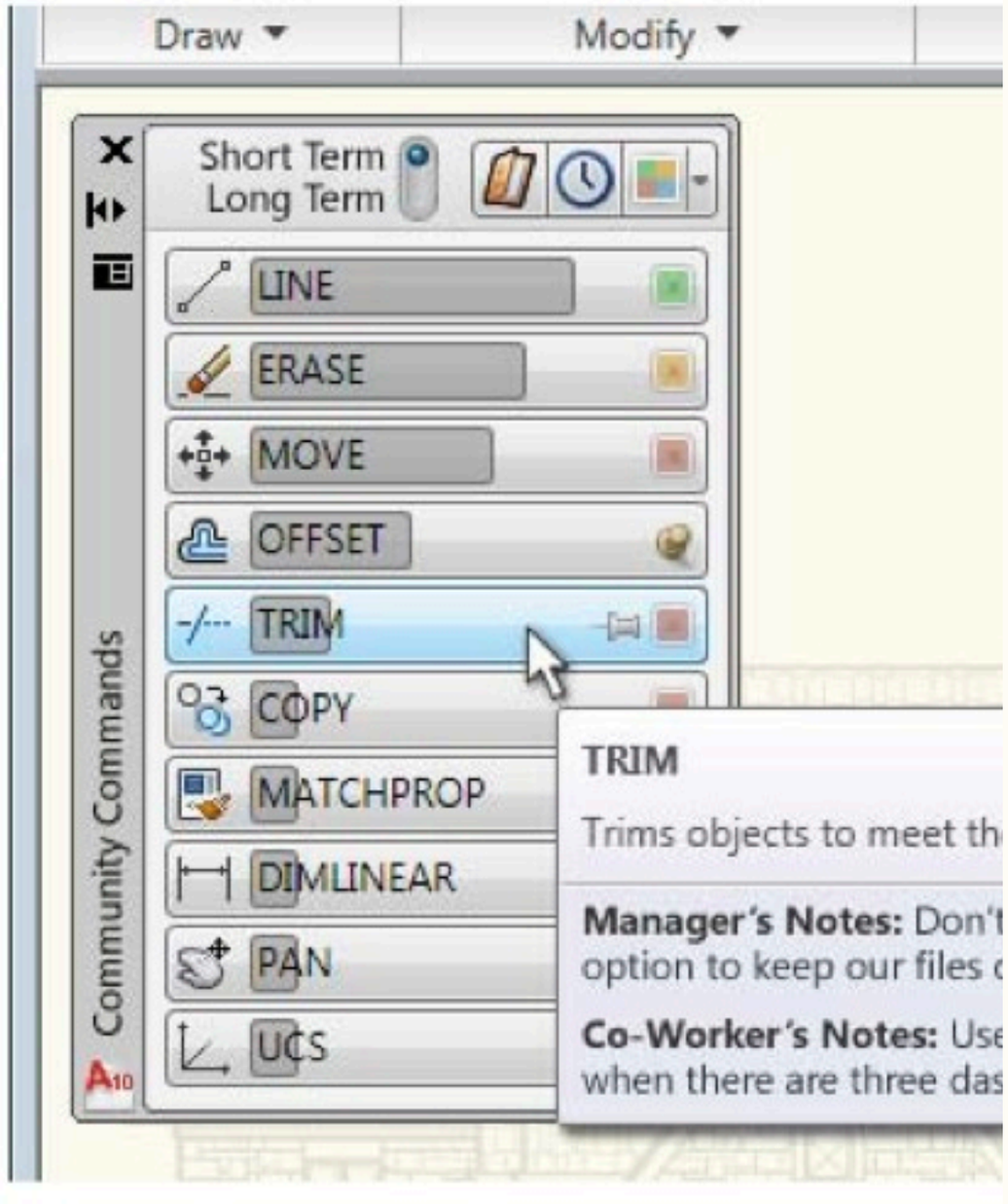

Image: [9] Matejka et al., UIST 2009

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COMMAND RECOMMENDING

Software IDE-based

[10] Murphy-Hill et al., SIGSOFT 2012

Models command discovery

Eight algorithms tested

Hybrid approach

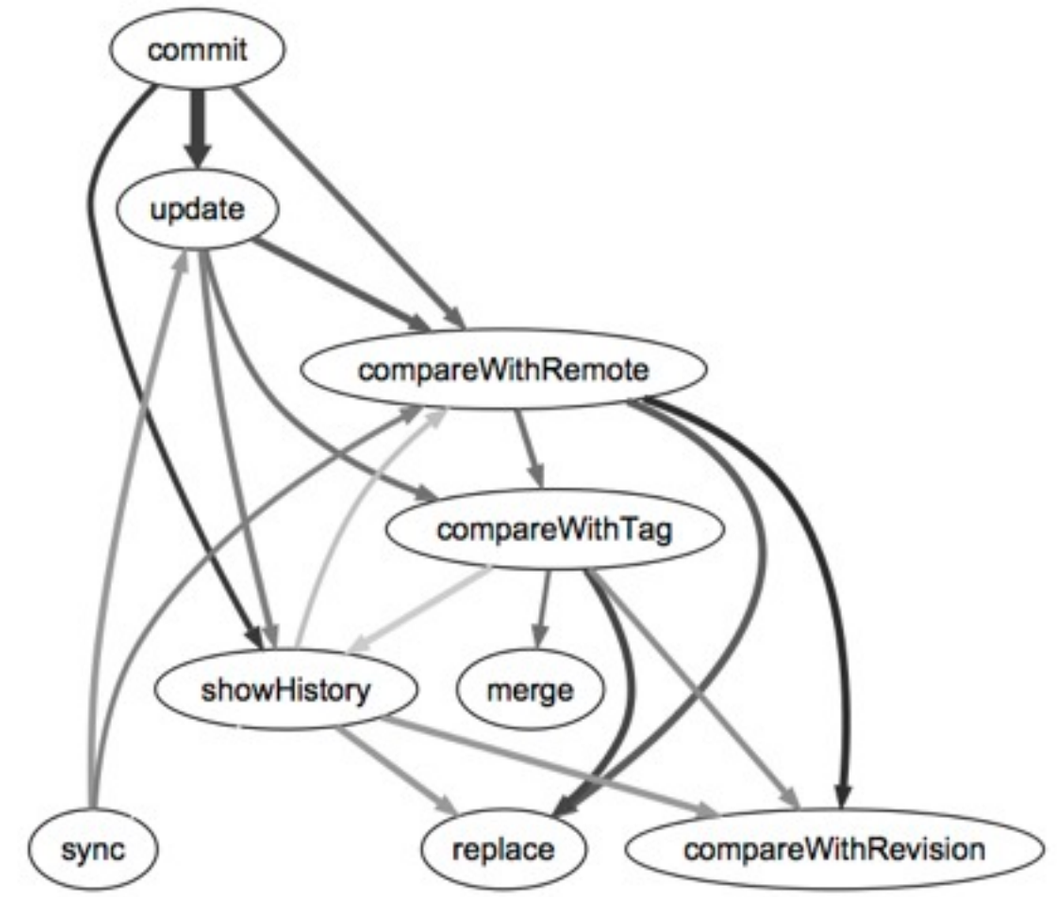

Image: [10] Murphy-Hill et al., SIGSOFT 2012

COMMAND RECOMMENDING

Major Results

Strong support for collaborative filtering

Major Issues

User’s tool inertia

One-and-done recommendations

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COMMAND RECOMMENDING

Future Work

Temporality

Sequences

Inefficiency-based recommendations

Adoption Rate

Metadata

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CONCLUSION

TAILORED INTERFACES CONTEXT-AWARE HELP COMMAND RECOMMENDING

Relatively fresh field

Collaborative filtering and context

Longitudinal studies

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DISCUSSION

REFERENCES

[1] Carroll, J. M., & Carrithers, C. (1984). Training Wheels in a User Interface, *Communications of the ACM.* 27(8), 800–806.

[2] Catrambone, R., & Carroll, J. (1986). Learning a word processing system with training wheels and guided exploration. CHI 1987 Conference Proceedings: SIGCHI/GI Conference on Human Factors in Computing Systems and Graphics Interface,169–174.

[3] Findlater, L., & McGrenere, J. (2007). Evaluating reduced-functionality interfaces according to feature findability and awareness. *Human-Computer Interaction–INTERACT 2007*, 592–605.

[4] Leung, R., Findlater, L., & McGrenere, J. (2010). Multi-layered interfaces to improve older adults' initial learnability of mobile applications. *ACM Transactions on Accessible Computing*, 3(1), 1–30. doi:10.1145/1838562.1838563.http

[5] Findlater, L., & McGrenere, J. (2010). Beyond performance: Feature awareness in personalized interfaces. *International Journal of Human-Computer Studies*, 68(3), 121–137. doi:10.1016/j.ijhcs.2009.10.002

[6] Matejka, J., Grossman, T., & Fitzmaurice, G. (2011). IP-QAT : In-Product Questions, Answers & Tips. *UIST 2011 Conference Proceedings:* ACM Symposium on User Interface Software & Technology*,*175-184*.*

[7] Ekstrand, M., Li, W., Grossman, T., Matejka, J., & Fitzmaurice, G. (2011). Searching for software learning resources using application context. *UIST 2011 Conference Proceedings:* ACM Symposium on User Interface Software & Technology, 195-204*.*

[8] Linton, F., Joy, D., Schaefer, H., & Charron, A. (2000). Owl: A recommender system for organization-wide learning. Educational Technology & Society, 65–69.

[9] Matejka, J., Li, W., Grossman, T., & Fitzmaurice G. (2009). CommunityCommands: command recommendations for software applications. *UIST 2009 Conference Proceedings*: ACM Symposium on User Interface Software & Technology, 193–202.

[10] Murphy-Hill, E., Jiresal, R., & Murphy, G. (2012). Improving Software Developers' Fluency by Recommending Development Environment Commands. *SIGSOFT 2012 / FSE-20 Conference Proceedings*: ACM International Symposium on the Foundations of Software Engineering, 1–11.