Monitoring Email to Indicate Project Team Performance & Mutual Attraction

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dub

school of information

MISC

Images: Usability.gov, OSU, cobaltpm, ehow, mathergy, blossom.io

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Status Report 'Sky Fly 830 Evaluation'

CS Campana Schott

Project Summary

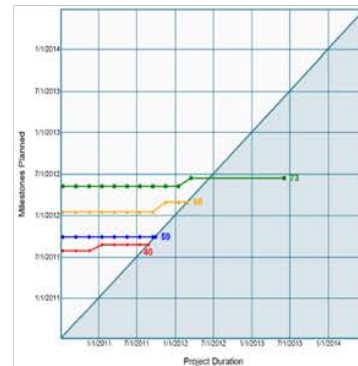|	
Report Period 2013-09	**Department** Engineering
Responsible Christine Williams	**Project Phase** Execution
Report Number 12	

Status Current — ❌ — 60%
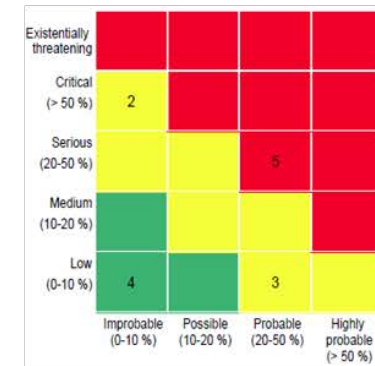
Status Previous — ✅ — 55%

Required Decisions

Key Performance indicators (KPIs) need to be approved by the Top Management.

The Design Team need to decide on the color of the interior.

Milestone Trend

Risk Matrix

Latest Actions

We had several changes in project recently. The costs are stable, the planed workload has risen slightly. All seems to be ok and we should not run scared.

Latest actions: Prepared key performance indicators (KPIs) for the control panel in the cockpit. Evaluated the KPIs based on initial tests.

Finalized the design for interior. Evaluated interior with 34 test persons to increase comfort and to get a feeling for the passenger experience.

Project Costs

https www.blossom.io

Duke Nukem Forever

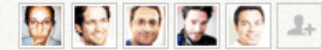Release once it is perfect and not one second earlier.

Proposal	Todo	In Progress	Party

Integrate KISSmetrics

To get a picture about retention we should track events like ...

Switch to Doom 3 Engine

It offers way superior graphics in comparison to the Unreal Engine

Switch to Unreal Engine of EPIC G...

It offers way superior graphics in comparison to Quake II Engine

READY

Hire two additional Programmers

Send to Archive

APPROVED

Optimize Anti-aliasing of Objects

To get rid of jagged and pixelated edges we should improve our current approach

Fix Collision Detection in Level 1

There is colliction detection glitch in Level 1. To reproduce ...

BLOCKED

Update Feature Page

Send to Archive

APPROVED

Implement High Dynamic Range ...

To preserve details that might otherwise be lost due to limiting contrast ratios

Status Report 'Sky Fly 830 Evaluation'

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Sky Fly 830 Evaluation, 2013-10-05, Christine Williams 1/4

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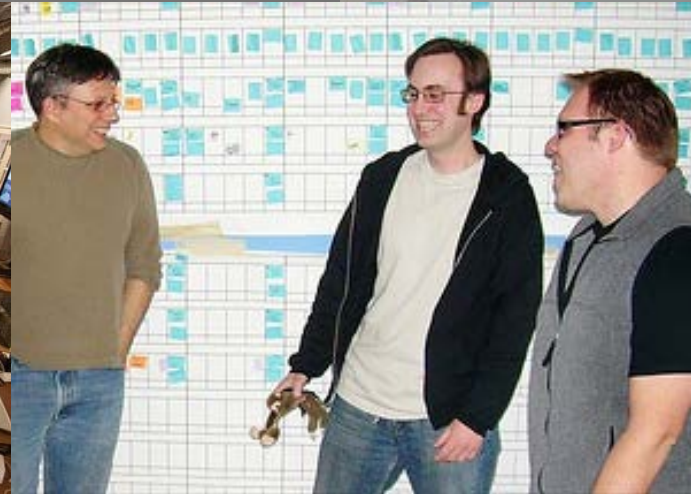| Proposal	Todo	In Progress	Party
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Less obtrusive, scalable indicators of team performance & cohesion?
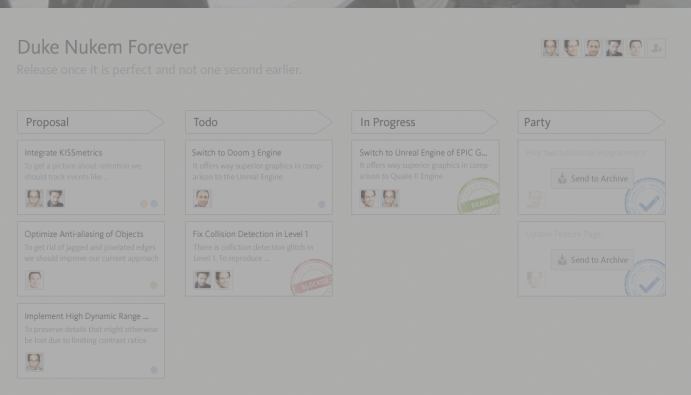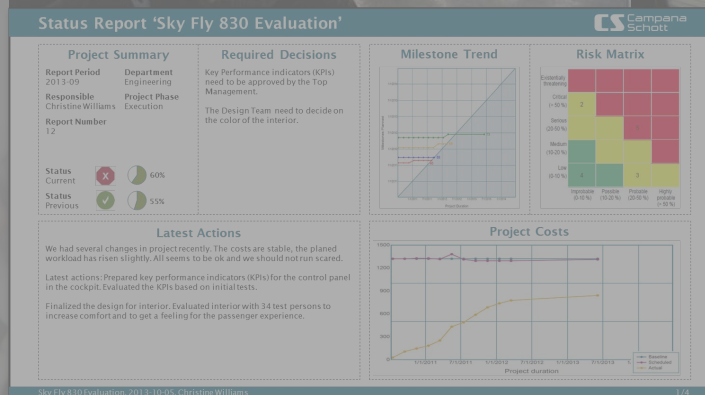
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Duke Nukem Forever

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Gonzales et al. 2009: In a lab study, linguistic mimicry indicates higher team cohesion in CMC and face-to-face settings, higher performance in CMC settings.

mimicry: Linguistic Style Matching (LSM)

Measures convergence in use of nine categories of function words per Linguistic Inquiry and Word Count tool (LIWC).

auxiliary verbs
e.g., can, has, am

articles
e.g., a, an, the

personal pronouns
e.g., her, I, we, they, you

indefinite pronouns
e.g., anyone, someone, others

prepositions
e.g., about, at, unless, till

negations
e.g., not, never, nor, nowhere, without

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e.g., not, never, nor, nowhere, without

conjunctions
also, though, but, while

quantifiers
all, besides, best, worst, some

Niederhoffer, KG & Pennebaker, JW. Linguistic style matching in social interaction. *Journal of Language and Social Psychology* 21 (2002), 337–360.

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Individual relative to group:

$$LSM_{c,n} = 1 - \frac{|p_{c,n} - p_{Gc}|}{p_{c,n} + p_{Gc}}$$

Group, per category:

$$LSM_{Gc} = \frac{\sum_{n \in G} LSM_{c,n}}{|G|}$$

Group, overall:

$$LSM_G = \frac{\sum_{c=1}^{9} LSM_{Gc}}{9}$$

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Taylor PJ and Thomas S. Linguistic style matching and negotiation outcome. *Negotiation and Conflict Management Research* 1, 3 (2008), 263–281.

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Also has been used to give real-time feedback in CMC conversations to improve student team performance.

Tausczik YR & Pennebaker, JW. Improving teamwork using real-time language feedback. *CHI* (2013), 459–468.

other linguistic indicators (Gonzales et al. 2009)

Higher team cohesion correlated with:
- Lower proportion of first-person plural pronouns.
- Higher word count.

Higher team performance correlated with:
- A higher proportion of future-oriented words.
- A lower proportion of achievement-oriented words.

All categories from LIWC

potential indicators for performance & cohesion in real-world project teams?

- LSM works in some CMC settings.

- Would LSM – or the other indicators – work in the longer term, with less complete traces?

study design

study design: research questions

LSM-related questions

- Does ↑ LSM indicate ↑ performance & ↑ mutual attraction?

- Are high-performing, cohesive teams born vs. made?

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Other linguistic measures

- Does ↓ first person plural pronouns and greater word count indicate ↑ mutual attraction?
- Does ↑ future-oriented words and ↓ achievement-oriented words indicate ↑ performance?

study design: setting

- Masters course at the University of Michigan

- In a quarter-long project, student teams (3-6 students) study an organization's process and recommend improvements.

study design: measures

- IV: Team emails (our account added to their email list), used for LSM and other indicators

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Consolidated model

Consolidated Flow Model

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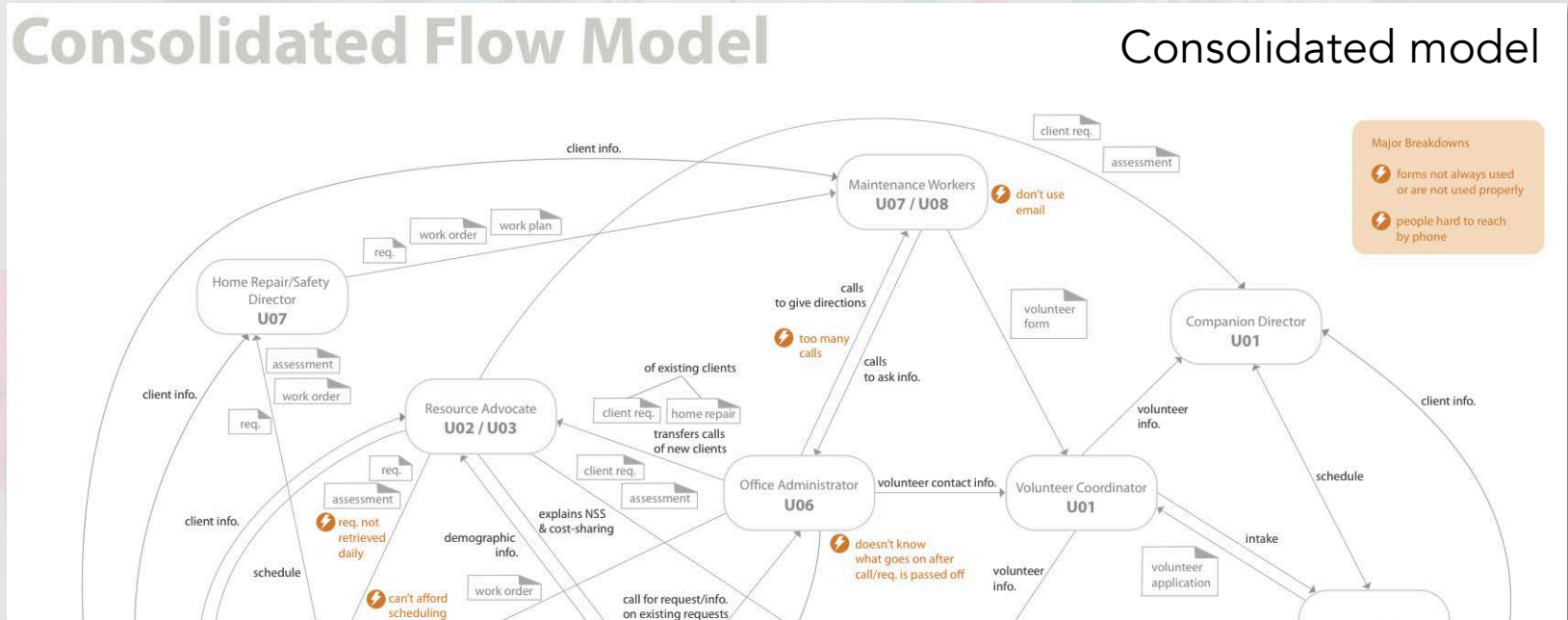
Affinity diagram & walkthrough

study design: measures

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SI 501 Contextual Inquiry:
The Huron River Watershed Council

Team: SI4HRWC
Terence O'Neill, Shauna Masura, Phillip Tularak, An Yang, Wenke Wang

Final presentation

study design: measures

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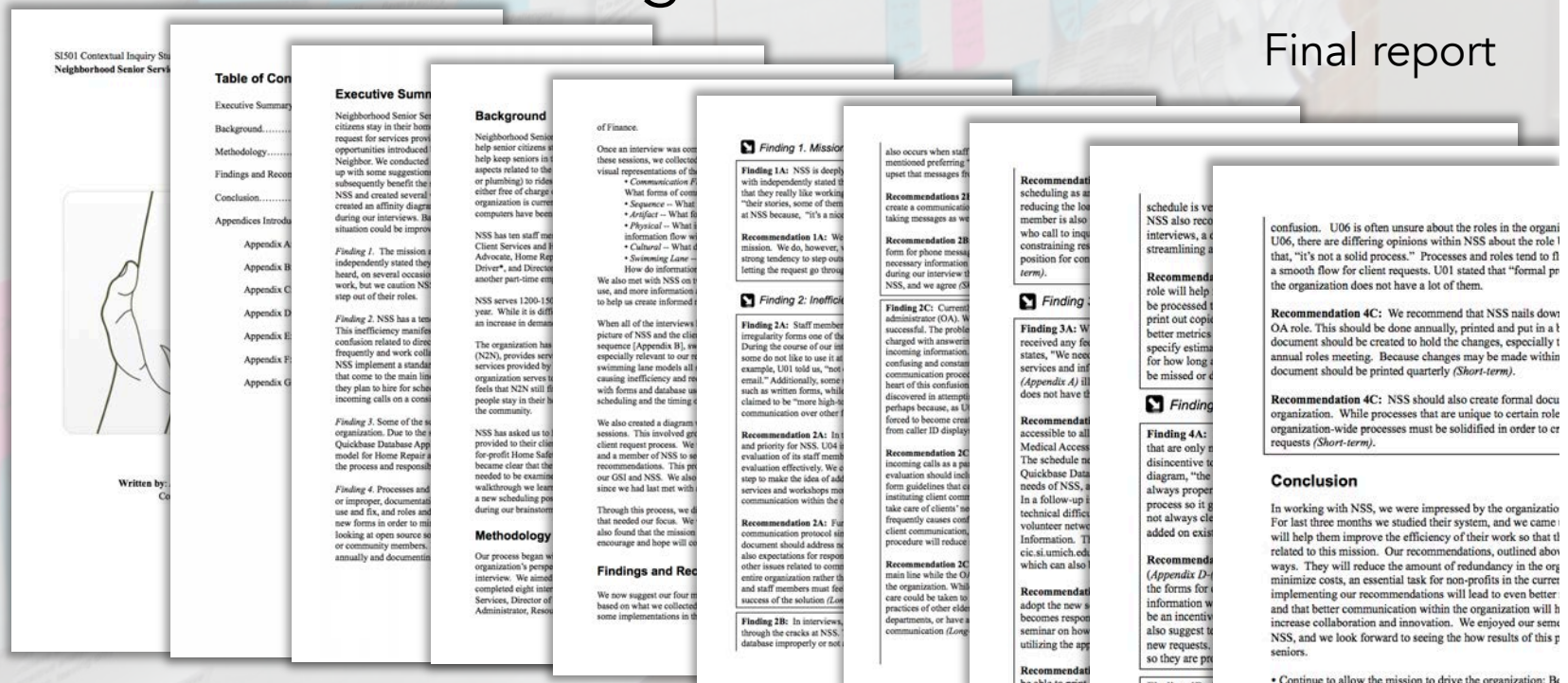Final report

study design: measures

- IV: Team emails (our account added to their email list), used for LSM and other indicators

- Dependent variables:
  - Grades on team assignments
  - Post-class survey
    - Team trust (Simons & Peterson 2000)
    - Shared understanding (Ko, Kirsch, King 2005)
    - Disposition to trust (Schoorman, Mayer, Davis 1996; used as control in models for trust)

study design: specific hypotheses

Higher LSM will correlate with:

- greater team trust (H1a) & greater shared understanding (H1b).
- greater performance (H2).

Other indicators:

- Lower proportion of first-person plural pronouns will correlate with greater team trust (H3a) & greater shared understanding (H3b).

- Greater word count will correlate with greater team trust (H4a) & greater shared understanding (H4b).

- Higher proportion of future-oriented words will correlate with higher performance (H5).

- Higher proportion of achievement-oriented words will correlate with lower performance (H6).

results

data

- Collection began in 2nd or 3rd week of semester (14 weeks), depending on team
- 30 of 44 project teams participated in this study (137 students)
  - Sufficient data from 27 project teams (124 students, 50 men and 74 women)
  - 6993 emails (average of 259 emails/team)

analyses

Regression analysis, controlled for group size and sex (measured as percentage of the team who was male), as well as disposition to trust in models for trust.

Assessed controlling for teaching assistant, but no difference and its use led to overfit models.

results: LSM

- No support for H1, LSM as indicator of team trust or shared understanding. Effects opposite of expected, but 95% confidence interval includes zero.

results: LSM

- No support for H1, LSM as indicator of team trust or shared understanding. Observed relationship small and opposite of expected, but 95% confidence interval includes zero.

- No support for H2, LSM as indicator of performance. 0.01 increase in LSM was corresponds to −0.04 point (95% CI: −0.27 to 0.18).

results: other linguistic indicators

No support for H3 (word count), H4 (first person pronouns), H6 (achievement words).

results: other linguistic indicators

Partial support for H5, a higher proportion of **future-oriented words** as a predictor for performance. 1% increase in proportion of future-oriented words corresponded to a 1.6 point increase in overall team score (95% CI: 0.5 - 2.25 points).

results: other linguistic indicators

Partial support for H5, a higher proportion of future-oriented words as a predictor for performance. 1% increase in proportion of future-oriented words corresponded to a 1.6 point increase in overall team score (95% CI: 0.5 - 2.25 points).

But we only see this effect in the first two team assignments, not the last two.

results

- LSM does not seem to be a good indicator of team performance or mutual attraction in this context.

- Future oriented word use *may* indicate performance. No support for other indicators in this context.

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Scissors LE, Gill AJ, Gergle, D. Linguistic mimicry and trust in text-based CMC. *CSCW* 2008.

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- Learning as performance vs. project success as performance.

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- Limited measures of team cohesion

results

- LSM does not seem to be a good indicator of team performance or mutual attraction in this context. Speculation about why, which could be tested in future work.

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thanks!

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