

# Scouting Requirements Quality Using Visual Representations

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# How to assess quality of this.

From page 157 of [1] :

**Req #:** 75

**Req Type:** 9 (functional requirement)

**Event/Use Case #:** 6

**Description:** The product shall issue a warning if the weather station fails to transmit readings.

**Rationale:** Failure to transmit readings from a weather station is faulty and needs maintenance. A weather station used to predict freezing roads may be faulty.

**Source:** Road Engineers

**Fit Criterion:** For each weather station, the product shall communicate to the user when the recorded temperature per hour is not within the manufacturer's range. The expected number of readings per hour is 24.

**Customer Satisfaction:** 3

**Customer Dissatisfaction:** 5

**Dependencies:** None

**Conflicts:** None

**Supporting Materials:** Specification of weather station

**History:** Raised by GBS, 28 July 99

[1] Robertson, S. AND Roberson, J. *Mastering the Requirements Process*, ACM Press, 1999 ([www.systemsguild.com/GuildSite/Robs/Template.html](http://www.systemsguild.com/GuildSite/Robs/Template.html))

From page 159 of [1]:

**Req #:** 110

**Req Type:** 11 (non-functional requirement - usability)

**Event/Use Case #:** 6, 7, 8, 9, 10

**Description:** The product shall provide training for new users.

**Rationale:** New users need training to use the product.

**Source:** S

**Fit Criterion:** Successful completion of training.

**Customer Satisfaction:** 3

**Customer Dissatisfaction:** 5

**Dependencies:** None

**Conflicts:** None

**Supporting Materials:** Training manual

**History:** Raised by AG 25 Aug 99

From website of [1] :

**Req #:** 74

**Req Type:** 9 (functional requirement)

**Event/Use Case #:** 7, 9

**Description:** The product shall record all the roads that have been treated.

**Rationale:** To be able to schedule untreated roads and highlight potential danger.

**Source:** Arnold Snow, Chief Engineer

**Fit Criterion:** The recorded treated and untreated roads shall agree with the drivers' road treatment logs.

**Customer Satisfaction:** 3

**Customer Dissatisfaction:** 5

**Dependencies:** None

**Conflicts:** None

**Supporting Materials:** None

**History:** Created February 29, 2006

**History:** Raised by AG 25 Aug 99

# Requirements Quality Questions

- If you could name the intended software system, what would you call it?
- Who are the main stakeholders for the system?
- What are the main functional requirements of the system?
- What categories of non-functional requirement are important to the system.?
- What techniques are used to describe the requirements?
- What are the *general contents* of the requirements document?
- What *requirements* are specified in the requirements document?

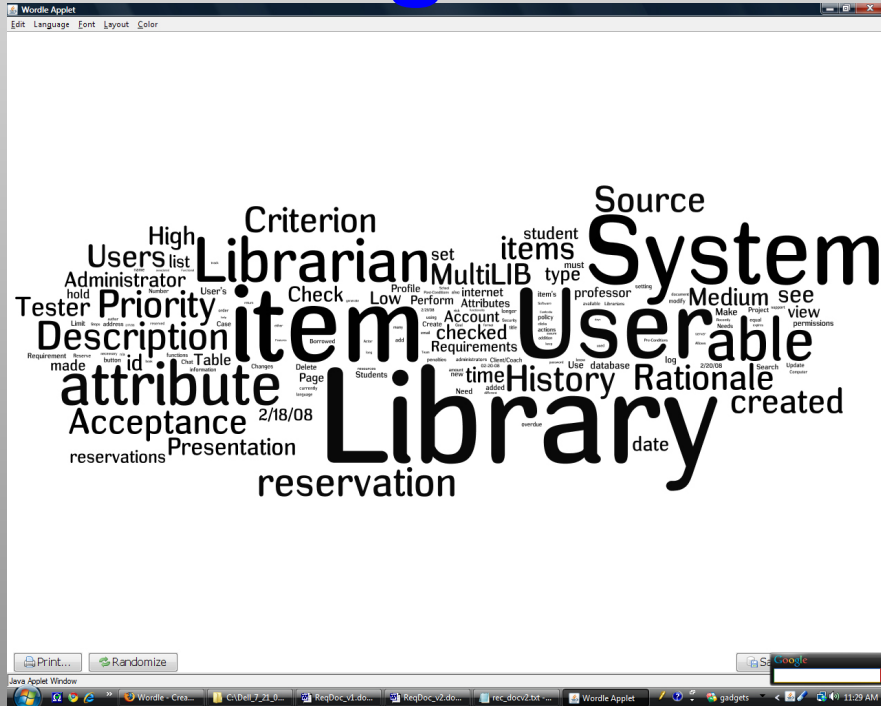
# Scouting Software Requirements

- A preliminary activity to highlight when and where a more careful inspection of requirements documents, is needed.
- An interactive and collaborative activity centered on a single visual representation of the requirements.

# Requirements for Visualization

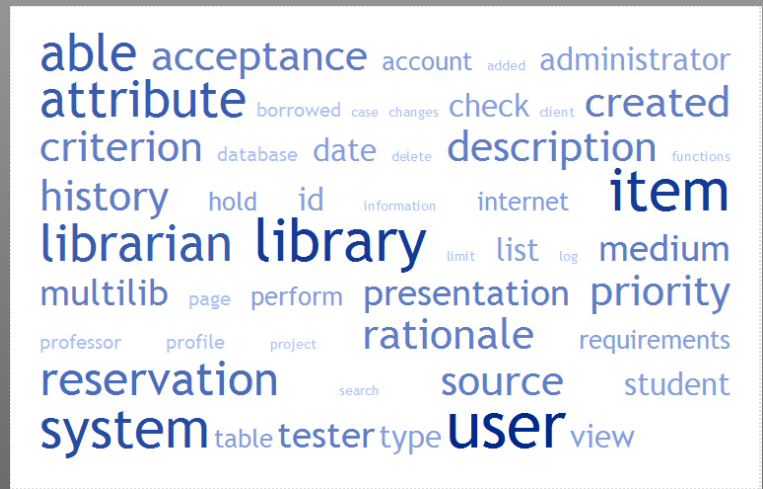
- Must capture the essence of the system
- Act as a trigger for stakeholder discussion
- Provide an alternative mode of communication
- *Be easy to use!*

# Text/Tag Clouds



Wordle – Top 150 words  
All words that appear 5 times  
or more

TagCrowd - Top 50 words





# Hypothesis

*A Wordle of a requirements document provides an effective visualization to help ascertain the quality of a requirements document at a cursory level.*

*It should:*

- *Highlight prominent terms*
- *Emphasize the problem that is being tackled*
- *Make clear whether the document is written in the language of the domain or populated with design constraints*
- *Yield a first impression on quality that is comparable with scouting the text of the requirements document itself*



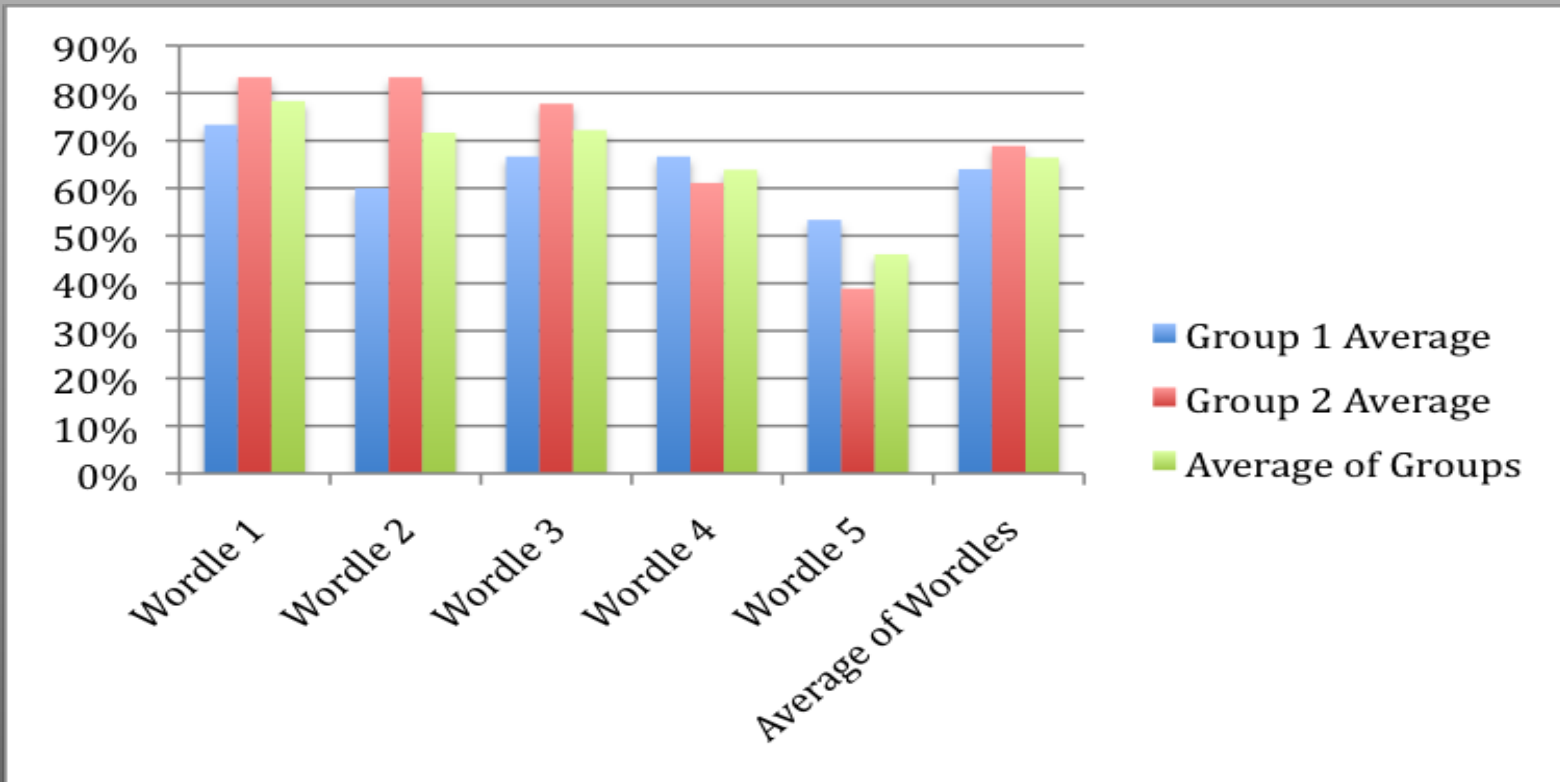


# Results: Part1

*Could subjects differentiate requirements documents Wordles from requirements document template Wordles ?*

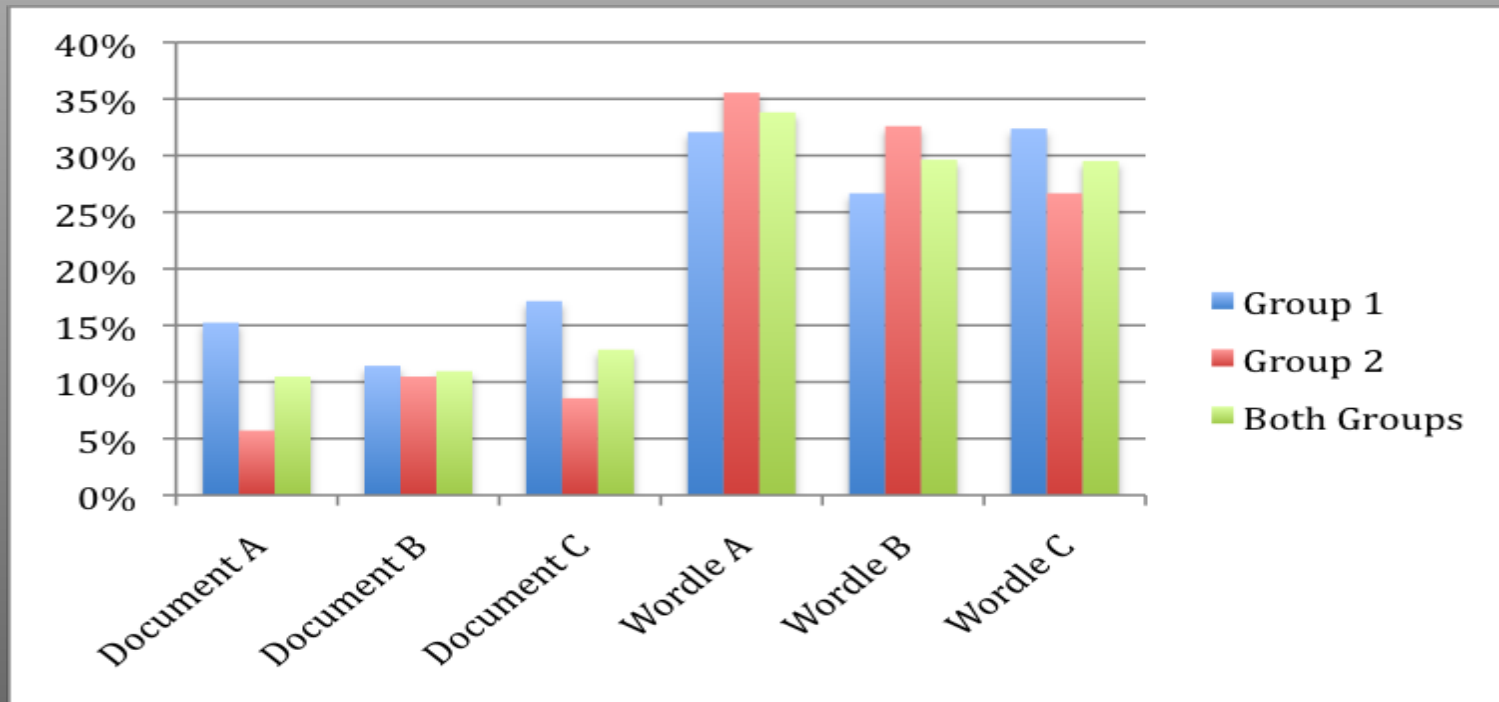
*Study Group 1: 15 graduate computer science students in a 2nd project-based course in software engineering*

*Study Group 2: 18 graduate software design and engineering students*



# Part 2: *Scouting Performance*

- The inexperienced group completed the scouting task 25% faster than the experienced group.
- Wordles users completed scouting from 12 to 20% faster than the control groups (inexper. vs. exper.).
- Group 1 performed better with Wordles when ranking quality accurately than Group 2 by 56% to 41%.
- Uncertainty about requirements document exhibiting quality properties



# Limitations

- *Wordles used to represent documents in their first instance*
- *Finding 'ideal' visual representation beyond the scope of our study*
- *Experimental studies limited in size and availability of artifacts.*
- *Font style and color scheme unoptimized*

# Conclusions and Future Work

- Wordles hold promise for scouting:
  - *as the size of a requirements document increases*
  - *for inclusion of stakeholders who have little prior exposure to writing or reviewing requirements*
- Wordles can concurrently act as a shared communicative artifact for conducting a directed requirements quality discussion
- Wordles cannot support all software development tasks - alternative visualizations are being explored.
- Ultimate goal is a dashboard of visual representations that act as triggers for discussions among parties.