

# Usability Testing:

What Have We **Overlooked**?

The screenshot displays the Hotel Pennsylvania website's reservation interface. The top navigation bar includes links for Home Page, Travel Agent, Group Reservations, Modify / Cancel, Penn 5000/Exclusive, and a language selector (English/US). The main content area is divided into three sections: 'Select Check-in and Check-out Dates', 'Select Just a Room', and 'Select a Package'.

**Select Check-in and Check-out Dates:** This section shows a calendar for October 2009 and November 2009. The check-in date is set to November 2, 2009, and the check-out date is set to November 4, 2009. The number of nights is 2. The room type is 'Superior 1 Full'. A note indicates that restrictions apply and users should mouseover for details.

**Select Just a Room:** This section lists available room types and their average daily rates:

Room Type	Average Daily Rate
Superior 1 Full Bed	USD199.00
Superior 2 Full Beds	USD224.00
Superior 3 Twin Beds	USD249.00
Penn 5000 Club King	USD224.00
Penn 5000 King Suite	USD274.00

**Enhance Your Stay:** This section offers an optional upgrade to a 'Hotel Penn Bathrobe' for USD40.00. The enhancement subtotal is USD40.00.

**Subtotal:** USD438.00

**Room Type:** Superior 1 Full

**Room Image:** A photograph of a Superior 1 Full Bed room, showing a large bed with a striped headboard, a desk, and a chair.

**Terms & Conditions:** A link to view the terms and conditions is provided.

**Footer:** The footer contains the hotel's address (401 SEVENTH AVE, NEW YORK, NY 10001), phone number (1-800-223-8885), and website (WWW.HOTELPENN.COM).

Hyoungtae Cho

# What is usability?

- *“How well users can **learn** and **use** a product to achieve their goals and **how satisfied** they are with that process”*
- Cannot be directly measured; quantified by means of indirect measures or attributes:
  - The number of reported problems
  - Ease of learning
  - Efficiency of use
  - Memorability
  - Error frequency and severity
  - Subjective satisfaction

# Terminology

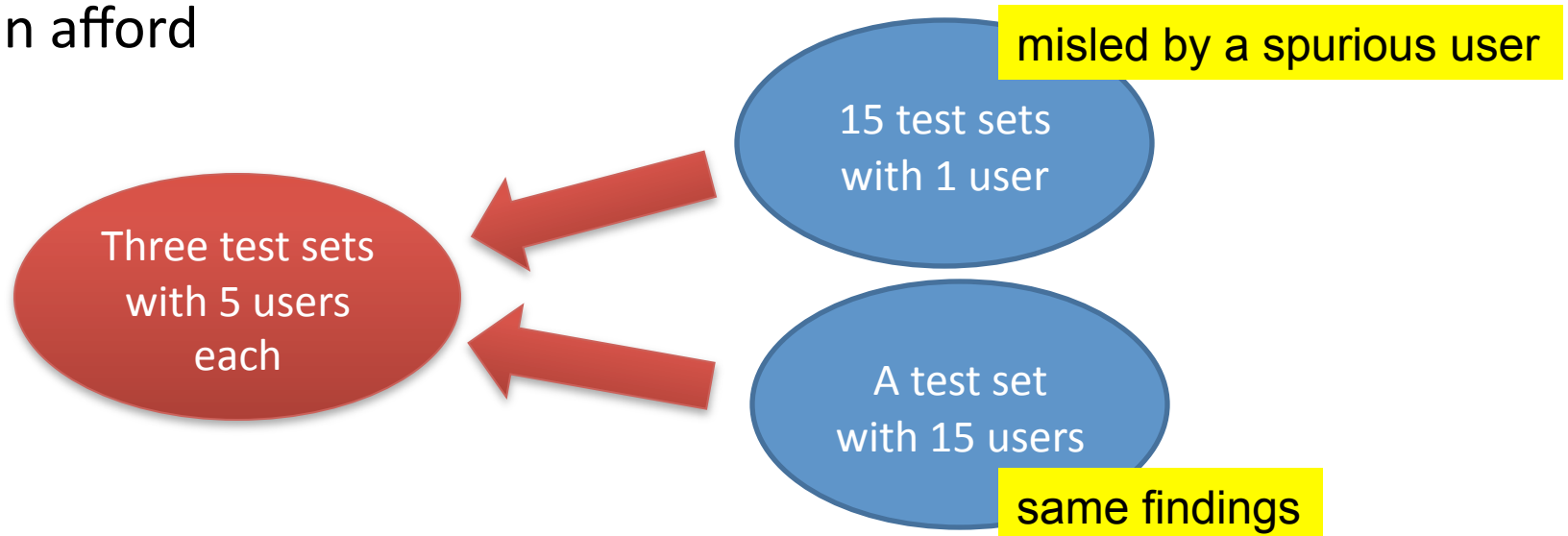
- Usability Testing: to evaluate a **product** by testing it on representative users from the **target audience** through specific **tasks**
- Expert Review: performed by usability experts to identify potential usability problems
- Return On Investment (ROI) of Usability: The returns from usability improvement against added efforts/costs (time & money)

# Usability Testing vs. Expert Review

	Usability Testing	Expert Review
Who conducts?	Representative people from target audience	A couple of Usability Experts
Useful	When finding real usability problems	When finding violations of usability/design standards
Length	4-6 weeks	1-3 weeks
Disadvantage	<ul style="list-style-type: none"><li>-Expensive and Time consuming</li><li>-Heavily depends on identifying right target group, accuracy of testing protocol</li></ul>	<ul style="list-style-type: none"><li>-False Positives</li><li>-Miss the real problems that cause users to fail tasks</li></ul>

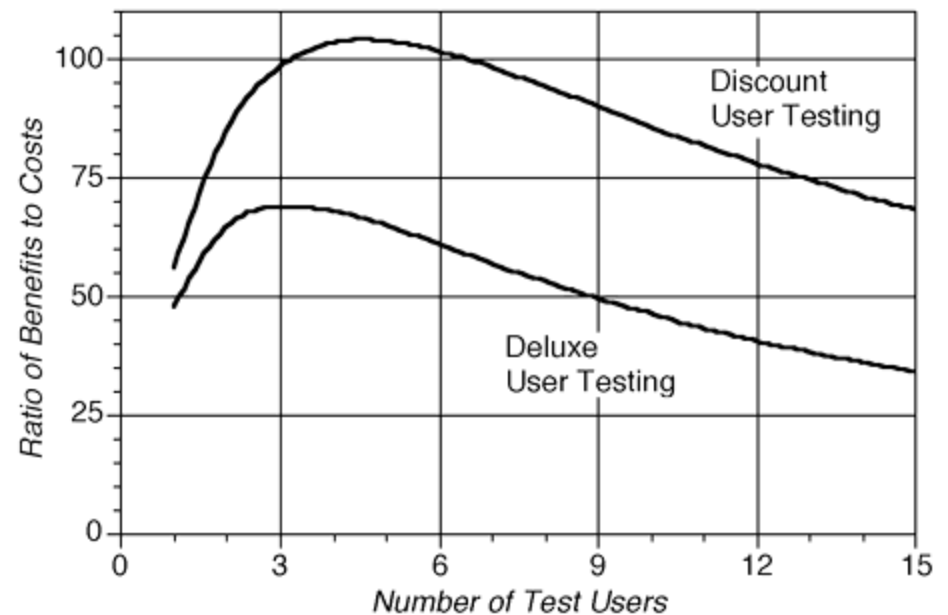
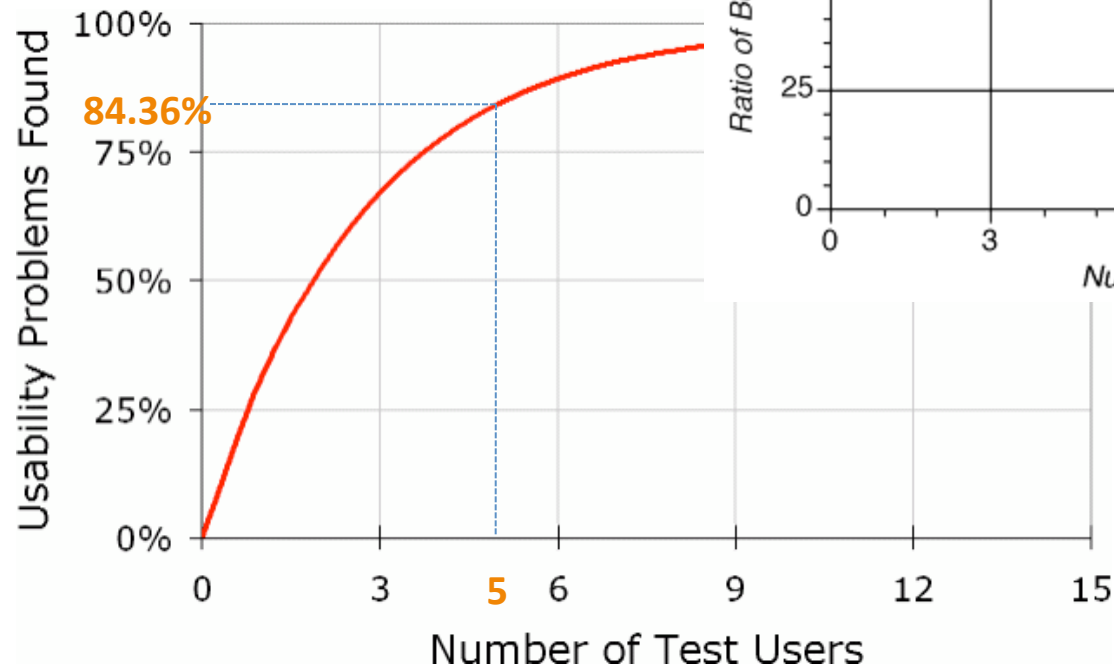
# Jakob Nielsen: the Magic Number 5

- Usability tests are very costly and complex?
  - Not True
  - *“Elaborate usability tests are a waste of resources”*
- No more than 5 users and running as many small tests as you can afford



# Jakob Nielsen: the Magic Number 5

- “Discount usability” model
- The proportion of Usability  
– L: usability problems found b  
– n: number of test users



# Conflicts against the magic number

- Arguing against the five-user guideline in terms of the claim on **statistical methods**:  $1 - (1 - L)^n$ 
  - A typical L, 31% exists? (varies from 8% to 51%)
  - As the number of participants is increasing, is the proportion of usability problems found increasing?
- Some **empirical researches** show that testing the first five uncovered much lower percentages (Spool: 35%, Faulkner: 55%) of usability problems than 85% as Nielsen claimed.

# Usability Testing: What Have We Overlooked?

- Gitte Lindgaard & Jarinee Charttratchart
- CUE: Comparative Usability Evaluation, to collect data for usability methods and techniques
- CUE-4: 17 professional teams to evaluate [www.hotelpenn.com](http://www.hotelpenn.com) (9 teams: usability testing, 8 teams: expert review)



# Usability Testing: What Have We Overlooked?

NEW YORK'S  
**HOTEL  
PENNSYLVANIA**

Home PageTravel AgentGroup ReservationsModify / CancelPenn 5000/ExclusiveEnglish (US)

Select Check-in and Check-out Dates ?

October 2009 - November 2009

October 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November 2009

1	2	3	4	5	6	7
	199	199				
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Restrictions apply, mouseover for details.

Clear Dates

Clear All Selections ?

Check-in: Nov 2, 2009Adults: 2

Check-out: Nov 4, 2009Children: 3-17 yrs 0

Nights: 2

Room Type: Superior 1 Full

Select Just a Room

Select a Room ? Best Available Rate

Average Daily Rate

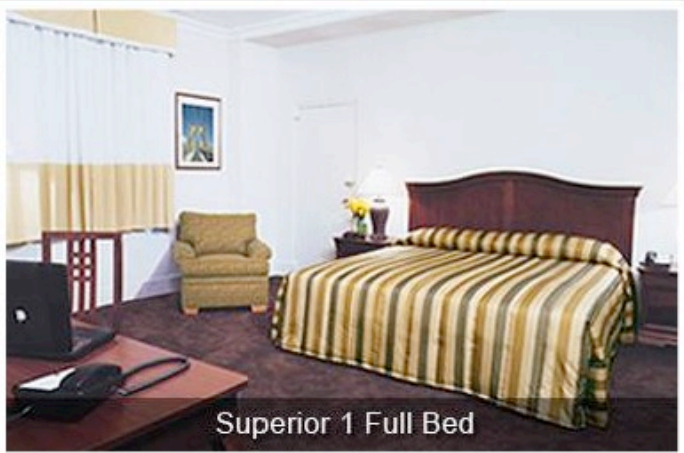
Superior 1 Full Bed	USD199.00
Superior 2 Full Beds	USD224.00
Superior 3 Twin Beds	USD249.00
Penn 5000 Club King	USD224.00
Penn 5000 King Suite	USD274.00

Enhance Your Stay: ?


☒ Hotel Penn Bathrobe USD40.00  
Take a Hotel Penn Bathrobe home with you.

Enhancement Subtotal: USD40.00

Select a Package



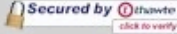
Superior 1 Full Bed



Superior room features 1 full bed, cable TV, in-room movies on demand, hair dryer, and iron and ironing board. Includes complimentary access to our Fitness Center.

Terms & Conditions

Subtotal: USD438.00

Secured by  click to verify

Continue This Reservation

NEW YORK - HOTEL PENNSYLVANIA | 401 SEVENTH AVE | NEW YORK | NY | 10001 | RESERVATIONS:1-800-223-8585 | WWW.HOTELPENN.COM

# Research Questions

- There is a correlation between **number of users** and the **proportion of problems found**.
- There is a correlation between **number of user tasks** and the **proportion of problems found**.

# Methods

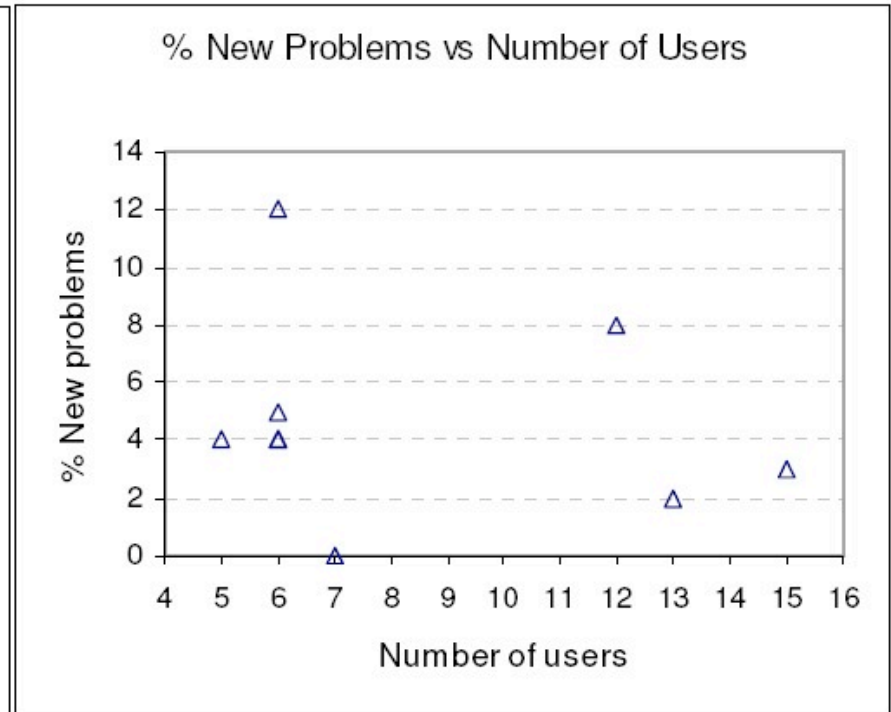
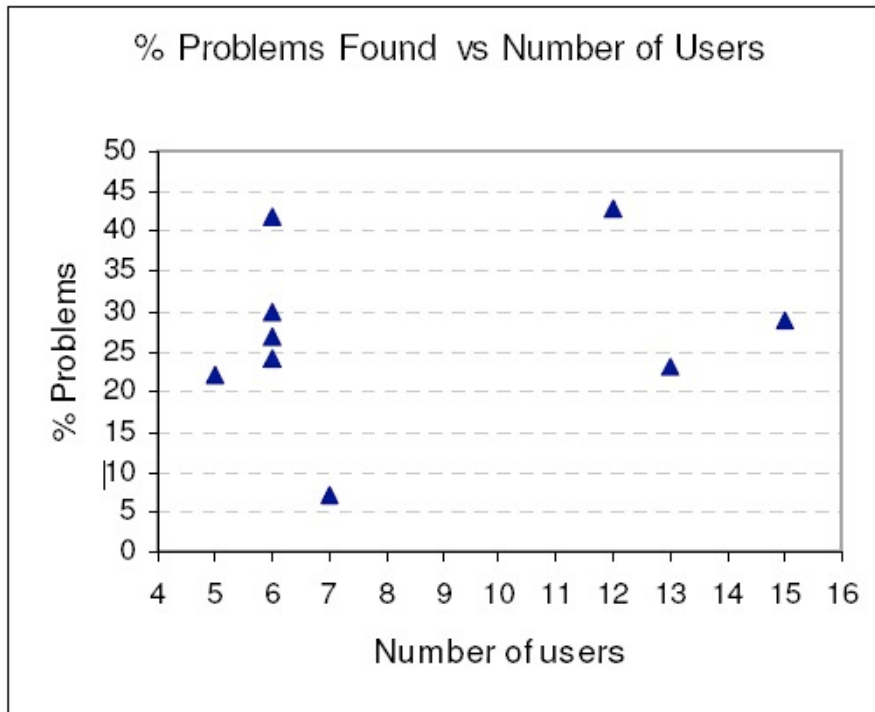
- Think-aloud Method
- 9 teams with different number of users

Team	A	H	J	K	L	M	N	O	S
# of Users	6	12	7	5	6	15	13	6	6

- Analyze Tasks and Scenarios
  - Task goal, e.g., Find an available room
  - User task, e.g., Check room availability of a particular room type on a certain date; check room availability for the following year, ...
  - User task token, e.g., going back to the home page; making a reservation for a family of three from June 28 to July 5
- Analyze the problems reported by each usability test team

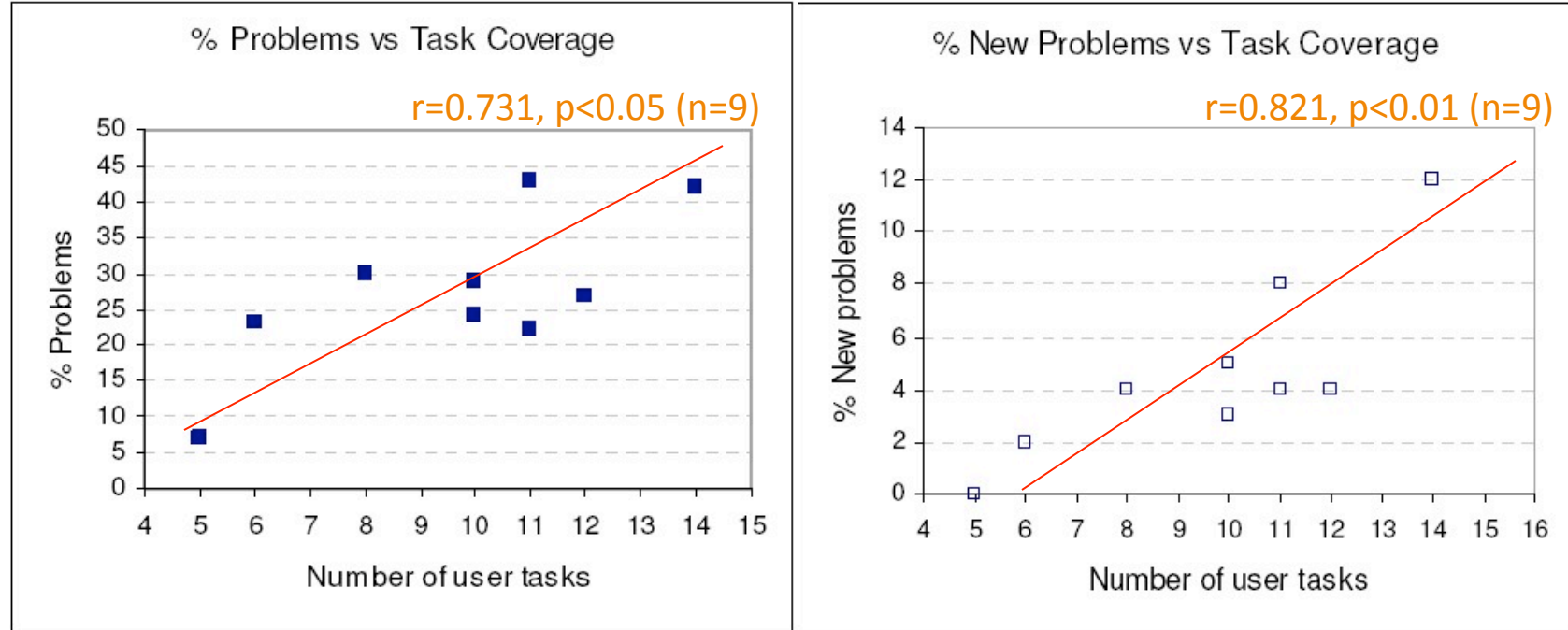
# Results

- Number of Users & Usability Problems found
  - No significant correlation



# Results

- Number of Users & Usability Problems found
  - Correlation exists



# Analysis on Results

Team	A	H	J	K	L	M	N	O	S
# of Users	6	12	7	5	6	15	13	6	6
# of user tasks	14	11	5	11	12	10	6	10	8
Problems Found(%)	42	43	7	22	27	29	23	24	30
% New problems	12	8	0	4	4	3	2	5	4

- Correlation between the number of users and the proportion of problems found was not supported
- Correlation between the number of tasks and the proportion of problems found was upheld
- 5 user claim was not supported (85% of the problems found)
- Role of participant recruitment (Team A & Team L)

# Summary

- What we have overlooked: Other contributing factors to improve usability such as task coverage and participant recruitment rather than sample size
  - Usability investigation on important target users & the most critical tasks
- If the goal of usability testing is to gather qualitative insights to improve products, one or two individual observations can provide them
- Nielsen's claim is useless?
  - In overall, the magic number 5 can be applied as one of quantitative assessment
  - To demystify the concept that usability testing is very costly at that time

# References

- Gitte Lindgaard , Jarinee Chattratchart, Usability testing: what have we overlooked?, Proceedings of the SIGCHI conference on Human factors in computing systems, April 28-May 03, 2007, San Jose, California, USA
- Nielsen, J. Why you only need to test with 5 users, Jakob Nielsen's Alertbox, March 19, 2000, <http://www.useit.com/alertbox/20000319.html>
- Faulkner, L. Beyond the five-user assumption: Benefits of increased sample sizes in usability testing. Behavior Research Methods, Instruments & Computers, 35, 3, Psychonomic Society (2003), 379—383
- Jared Spool , Will Schroeder, Testing web sites: five users is nowhere near enough, CHI '01 extended abstracts on Human factors in computing systems, March 31-April 05, 2001, Seattle, Washington