

# ROLES OF NOTES IN CO-LOCATED COLLABORATIVE VISUALIZATION



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# Problem

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- How to best support record-keeping in co-located collaborative visualization?



# User Study

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- **Objective:** Studying users' behavior while collaboratively visualizing and analyzing business data using large displays
- **Apparatus:** wall and tabletop display
- **Participants:** 27 (9 groups of 3)
- **Tasks:**
  - ▣ Task 1 :6 focused questions.
  - ▣ Task 2 :a business case.

# Apparatus

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## Software: Polestar on demand

Home | Configure | Export | Exploring: eFashion in Excel.xls SAP BusinessObjects Explorer in the cloud

Refreshed On: 2009/09/11 21:46 Records 3,272 (0.016s)  Search

Items to Select

Measures: Sales revenue (SUM) | Quantity sold (SUM) | Margin (SUM) (Showing 1 To 5 Of 6 Suggesti

Year	City	Quarter	Lines	State	Category
2,003	New York	Q1	Sweat-T-Shirts	Texas	T-Shirts
2,002	Houston	Q4	Accessories	New York	Jewelry
2,001	Los Angeles	Q2	Shirt Waist	California	Hats,gloves
	San Francisco	Q3	Dresses	Illinois	Short sleeve
	Chicago		Sweaters	DC	Belts,bags
	Washington		Outerwear	Colorado	Evening wear
	Austin		Trousers	Florida	Long sleeve
	Colorado Springs		Jackets	Massachusetts	2 Pocket shirts
	Dallas		Overcoats		Day wear
	Miami		City Skirts		Soft fabric
	Boston		City Trousers		Turtleneck
			Leather		Cardigan
					Sweats

Visualize the Data

Category

Category	Sales revenue	Quantity sold	Margin
T-Shirts	11,972,779.4	66,657	5,120,879.
Jewelry	5,180,094.1	32,471	1,998,187.
Hats,gloves,scarves	1,698,874.3	12,419	689,455.
Short sleeve	1,642,563.4	9,105	720,465.
Belts,bags,wallets	1,642,491.9	10,894	609,188.
Evening wear	1,520,388.3	10,901	630,75
Long sleeve	1,302,660.4	8,050	517,182.
2 Pocket shirts	1,072,995.7	5,442	378,570.
Day wear	984,892.8	7,581	410,323.
Soft fabric	974,878.5	5,908	383,609.
Total (34)	36,387,202.8	223,229	14,586,939.

# Note Content

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- High level category:
  - ▣ Findings (e.g. observations, decisions)
  - ▣ Cues (e.g. to-do list)
- Lower level category:
  - ▣ Numbers (e.g. data value)
  - ▣ Drawing (e.g. flag, chart)
  - ▣ Text (e.g. question, reminder)
  - ▣ Symbols (e.g. %, \$)

# Note's Scope

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## Group note

State	Approximate Population (millions)
California	36.5
New York	19.3
Texas	23.9

*45.8% up 79.7 total*  
*24.2% low*  
*30% mid*

**Remember that you represent one state.** You should try to obtain as much of the budget as you reasonably can for your state, while still cooperating to ensure the success of the company as a whole.

Category	Texas 23.9M	NYC 19.3	Calif 36.5
Sweat shirts	3.3M (13.8%)	2.3M (12%)	2.7M (7.4%) ↑
Accessories	2.8M (11.7%)	2.2M (11%)	1.8M (5.8%) ↑
Shirt waist	1.1M (4.6%)	.7M (3.6%)	.8M (2.2%) ↑
Sweaters	0.830M (3.5%)	.7M (3.6%)	.5M (1.4%) ↑
Dresses	0.820M (3.4%)	.6M (3.1%)	.5M (1.4%) ↑

*popularity*  
*total*

*100,000*  
*% of budget*  
 ↓ 25      35      40  
 ↑ 20      35      45

## Personal note

State	Approximate Population (millions)
California	36.5
New York	19.3
Texas	23.9

*0.202* → 40,000 \$  
*0.39* → 30,000 \$  
*0.4* → 30,000 \$

*100%*  
*2: → 3-7 → 40%*

**Remember that you represent one state.** You should try to obtain as much of the budget as you reasonably can for your state, while still cooperating to ensure the success of the company as a whole.

*2003*    *2002*    *2001*  
 Sales: Texas - ↑    C    C  
                   New -    C    N  
                   Calif -    N    N

*popularity*  
*total*  
*popularity*  
*total*

*California: Accessories, Sweatshirt, Shirt waist*  
*Texas: Accessories, Sweatshirt, Shirt waist*  
*NY: Accessories, Sweatshirt, Shirt waist*

# Note Usage

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- Further analysis
- Facilitate problem solving
- Create reports/presentation
- Validate
- Reminder

# Possible solutions

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- Integrating notes with the visual representation.
- Adding speech to text annotation feature.
- Different mechanism for personal and group notes.
- Integrating group notes into a history mechanism.
- Support personal notes with paper, digital paper, wireless pens.



# Discussion

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- ❑ How can we best support note taking?
- ❑ Should it be integrated into a history mechanism or should be a separate component?
- ❑ Should history mechanism be automated or user controlled?
- ❑ How can we support both individual and group notes?
- ❑ How to use personal notes if needed?