



How **R** helps personalization analysis in marketing campaign

Junjun Zhu
eBay CAC

Agenda

- What do analysts do?
- Why we need **R**?
- Case Study: KSNY Campaign

eBay Analytics

>50 TB/day new data

>100k data elements

>100 Trillion pairs of information

>100 PB/day

Processed

>50k chains of logic

>6000

business users & analysts

>6000

tables

turning over a TB every second

24x7x365

Always online

Millions of queries/day

99.98+% Availability

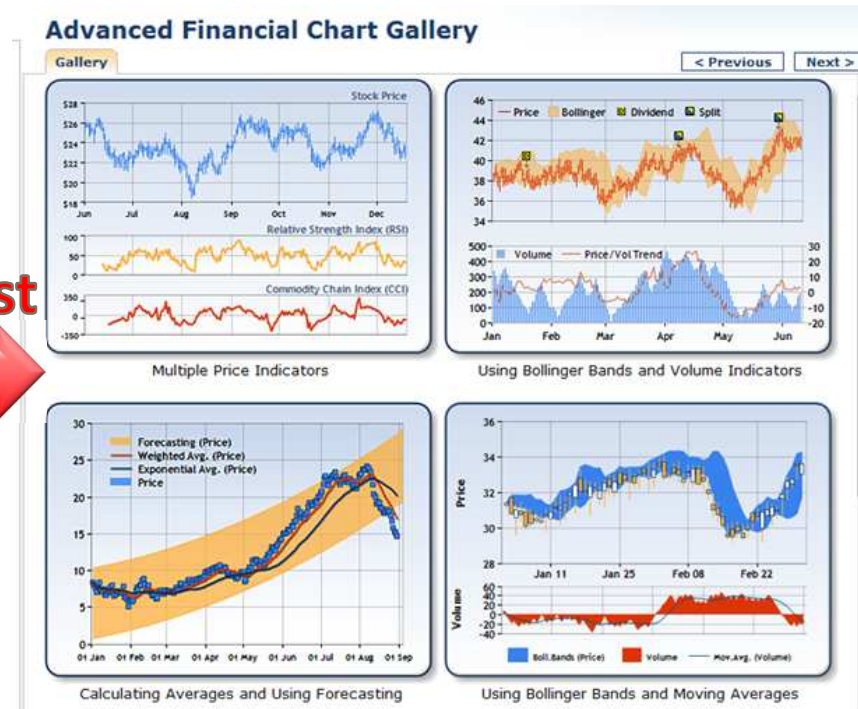
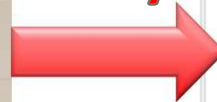
Near-Real-time

What Do Analysts Do?

Big data → Big Opportunity



Analyst



How do we use R?



Access Data via R

```
1 sqlrun<- function (sqlfile,start_dt,end_dt,odbc) {
2   #read the SQL file
3   SQLin<-paste("D:/Project/Site/All Reports/SQL Runs/",sqlfile,sep="")
4   query<-scan(SQLin, what=character(1))
5   query<-gsub(":start_dt",start_dt,query)
6   query<-gsub(":end_dt",end_dt,query)
7   write.table(x=query, file=paste("D:/Project/Site/All Reports/SQL Runs/R",sqlfile), quote=F, row.names=F,col.names = F)
8   query<-gsub("--", "@", query)
9   query<-gsub("/*", "@", query, fixed=T)
10  write.table(x=query, file="D:/Project/Site/All Reports/SQL Runs/queryin.txt", quote=F, row.names=F,col.names = F)
11  query2<-scan("D:/Project/Site/All Reports/SQL Runs/queryin.txt", what=character(0), sep="!", quote="!", comment.char = "{
12  #convert into one line r like script and skip comments
13  query3<-""
14  for (i in 1:length(query2)){
15    if (substr(query2[i],1,2)!="--" & substr(query2[i],1,2)!="/*" & substr(query2[i],1,2)!="{") {query3<-paste(query3,
16  }
17  write.table(x=query3, file="D:/Project/Site/All Reports/SQL Runs/queryin2.txt", quote=F, row.names=F,col.names = F)
18  query4<-scan("D:/Project/Site/All Reports/SQL Runs/queryin2.txt", what=character(0), sep=";", quote="!", comment.char = '
19
20  #run the r version
21  library(RODBC)
22  Wildcat <- odbcConnect("Wildcat")
23  query5<-""
24  for (i in 1:(length(query4)-1)){
25    a<-sqlQuery(Wildcat,query4[i])
26    print(query4[i])
27    query5<-paste(query5,query4[i],";")
28    write.table(x=query5, file="D:/Project/Site/All Reports/SQL Runs/queryout.txt", quote=F, row.names=F,sep=";")
29    #print(a[1,1])
30  }
31  odbcClose(Wildcat)
```

Dynamic SQL

Access to all Database

R vs. EXCEL on Data Visualization

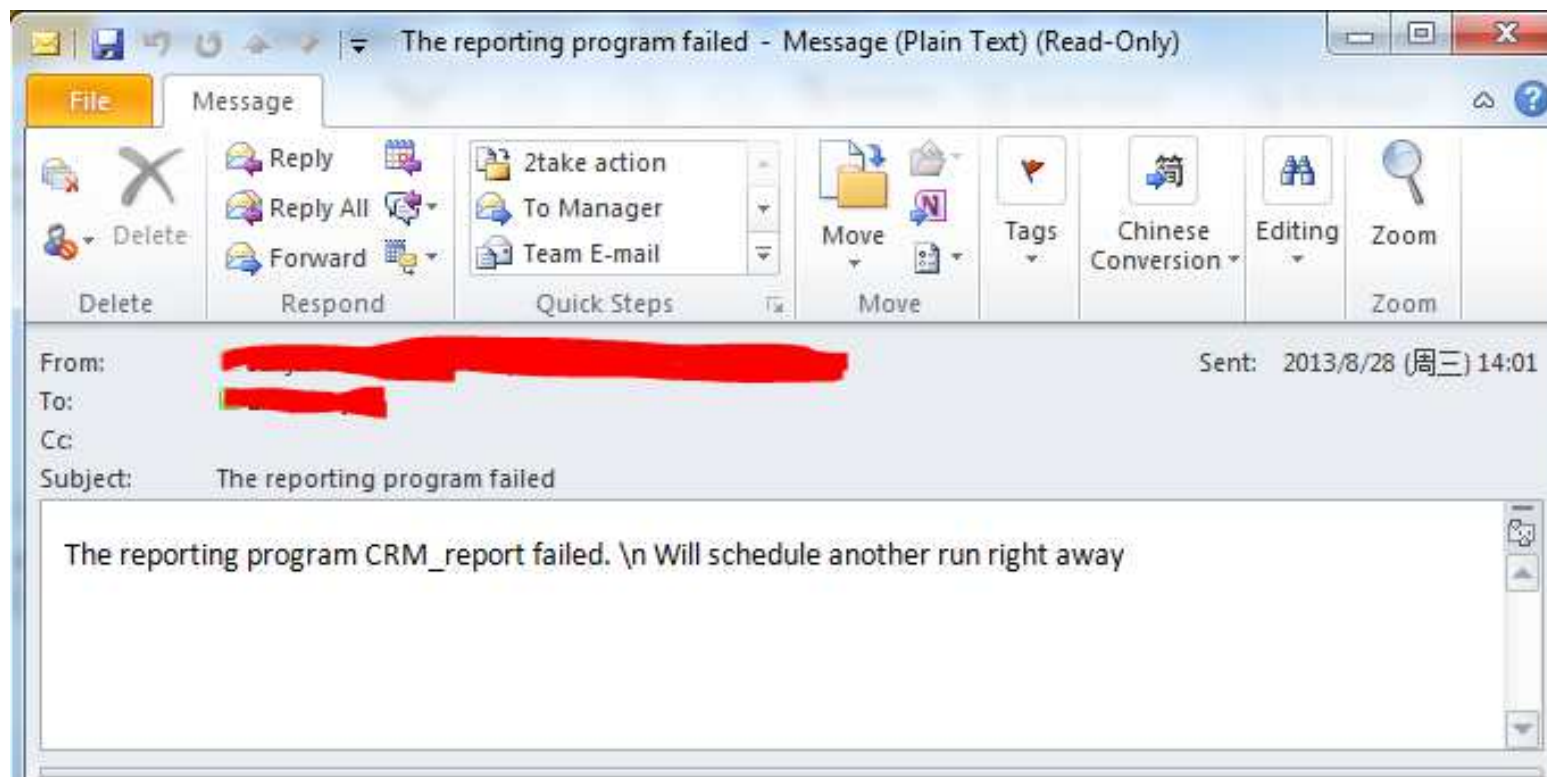
When to use Excel?

- EASY - Need small handful of descriptive stats on your data
- QUICK - Need to look something up, run a quick sort/filter, or even a pivot table

When to use R?

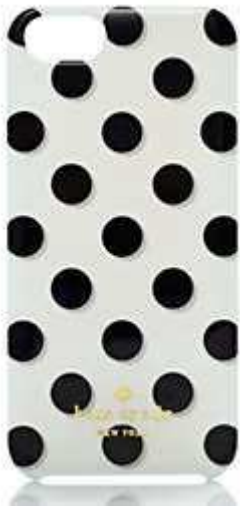
- STATISTICS - to provide serious statistical reports
- VARIETY - to explore data in all kinds of graphical visualization
- TRACKING - tracking modification after data cleaning
- BEAUTIFUL - to present & impress your audience

Simple Notifications via R



Case Study: Personalization Analysis for One Big Seller in eBay

- Sense of fashion trends?



Marketing Levers

Invited users + Fashion shoppers were targeted with:



Email



On-eBay Ads



In-app mobile ads

All relevant kw item searches triggered:

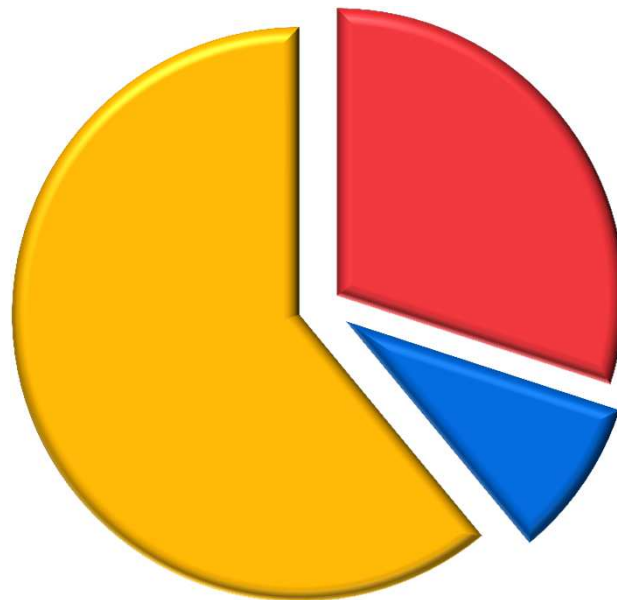


ksny traffic drivers, and ksny items in core listings

Marketing Lever Performance

- Email is the most important lever by far;
- Opportunity to increase semi-private and onsite sales

Contribution of Sales by Lever



- Red Share: email
- Blue Share: eBay onsite Ads
- Yellow Share: Semi-private Sale Component: Organic entry, eBay Search

Email Personalization– Send Time



Email Personalization – Send Time

New technology uses individual's last 90-day email engagement to **send emails based on when the user has opened/clicked in the past**, therefore increasing the likelihood that the ksny on eBay email is at the top of the inbox when the user checks their mail.

We have 90-day history for ~25% of Dec's invitees.

Proposed Test Segments for Next Sale	
No STO Data Available	~75% of invitees
STO Control	~12.5% of invitees
STO Test	~12.5% of invitees

A/B Test

TEASER EMAIL (22nd):

6 AM – 8 AM – **Non** STO users (metered for deliverability)

6 AM – STO Control

6 AM – 5 AM – STO Test (deploying every hour)



SALE EMAIL (Sale begins at 6 AM on 23rd)

6 AM – 8 AM – Non STO users (metered for deliverability)

6 AM – STO Control

6 AM – 5 AM – STO Test (deploying every hour)



REMINDER EMAIL (Reminder Email starts 24th, Sale ends 25th at 9 PM)

6 AM – 8 AM – non STO users (metered for deliverability)

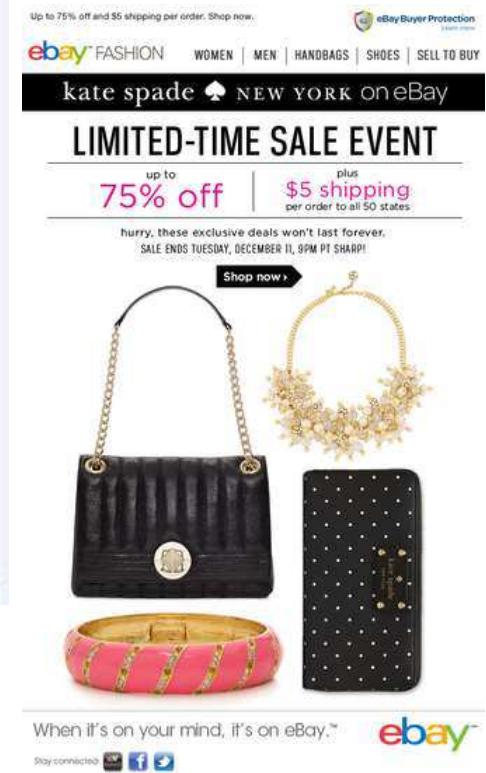
6 AM – STO Control

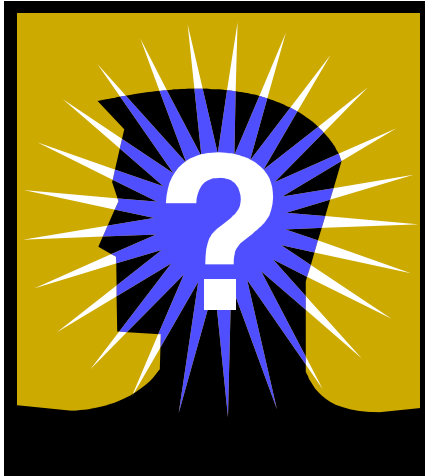
6 AM – 5 AM – STO Test (deploying every hour)

Challenges for STO

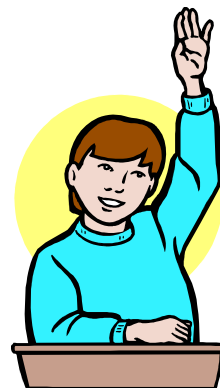
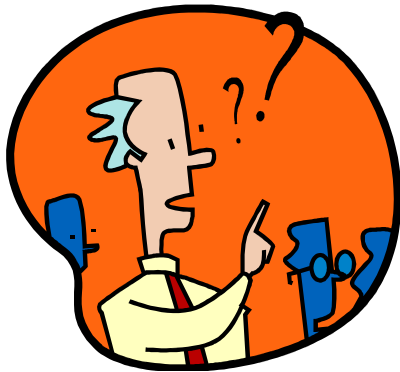
- Sellers **understand** and **approve**?
- Require massive historical data to increase the engagement of relevant users (and offset a decrease of blasts to those unengaged)
- **90% significance** (at the aggregate level based on the test and control cell volumes from Nov):
if the **lift / difference** between test & control $\leq 0.5\sim0.75\%$,
→ **Statistically Insignificant**

Email Personalization – Creative





Questions?



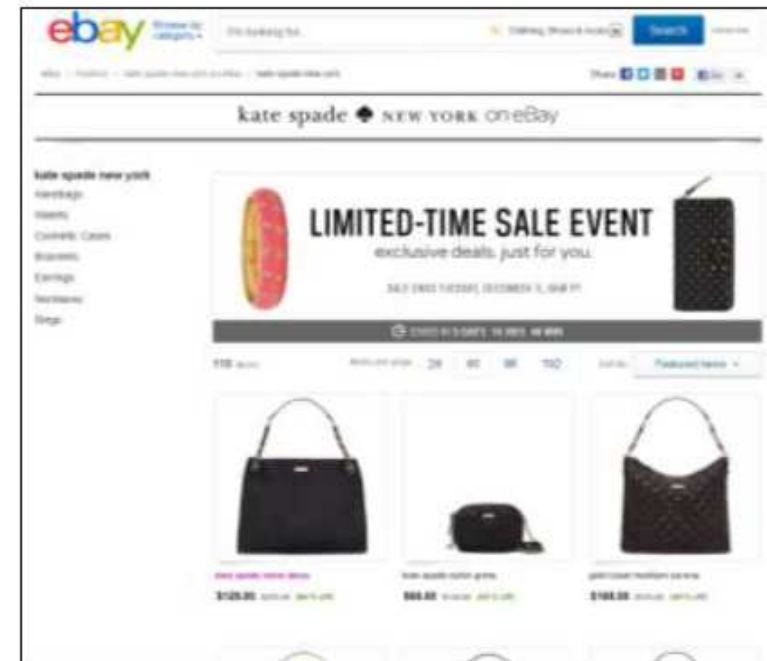
Appendix

Visuals of User Entry Points

#1



#2



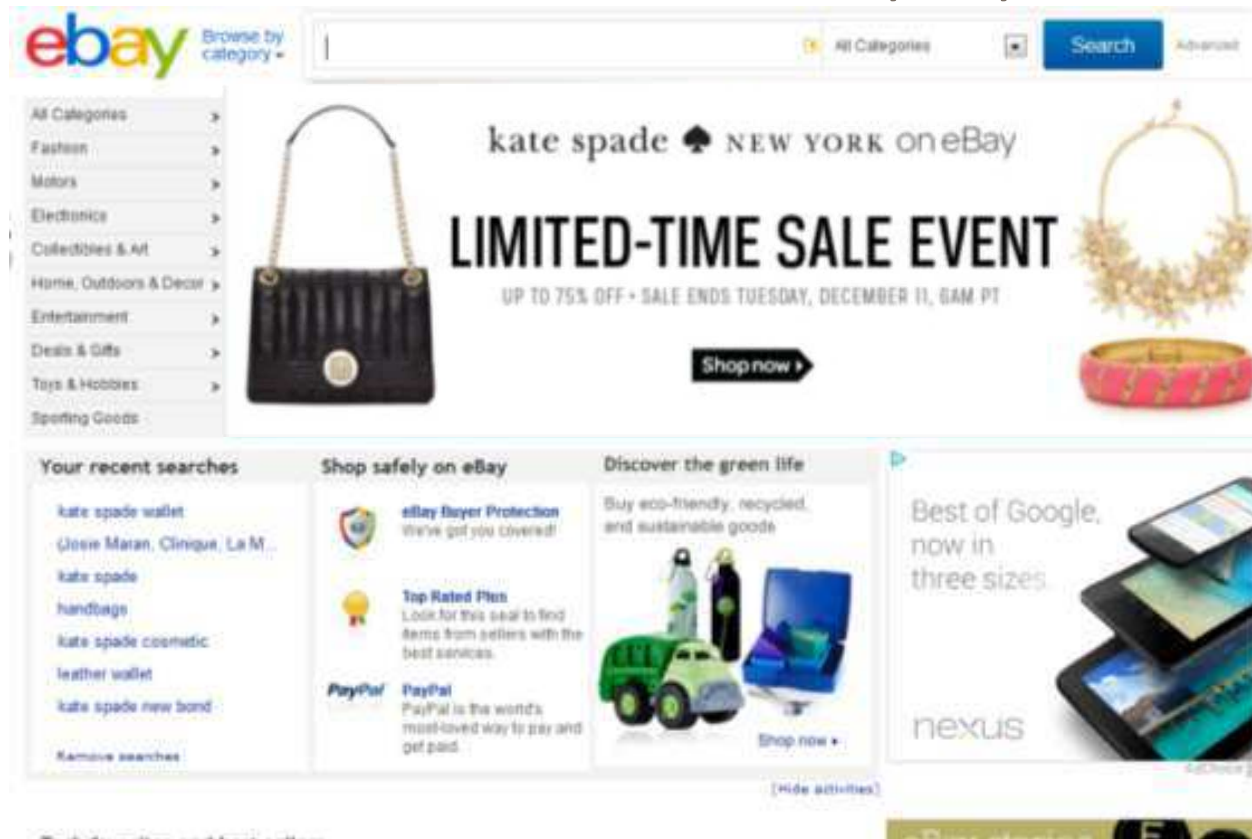
Click on mktg (emails + onsite)

Directly to Sale SRP

eBay.com Billboard

First slide of Billboard

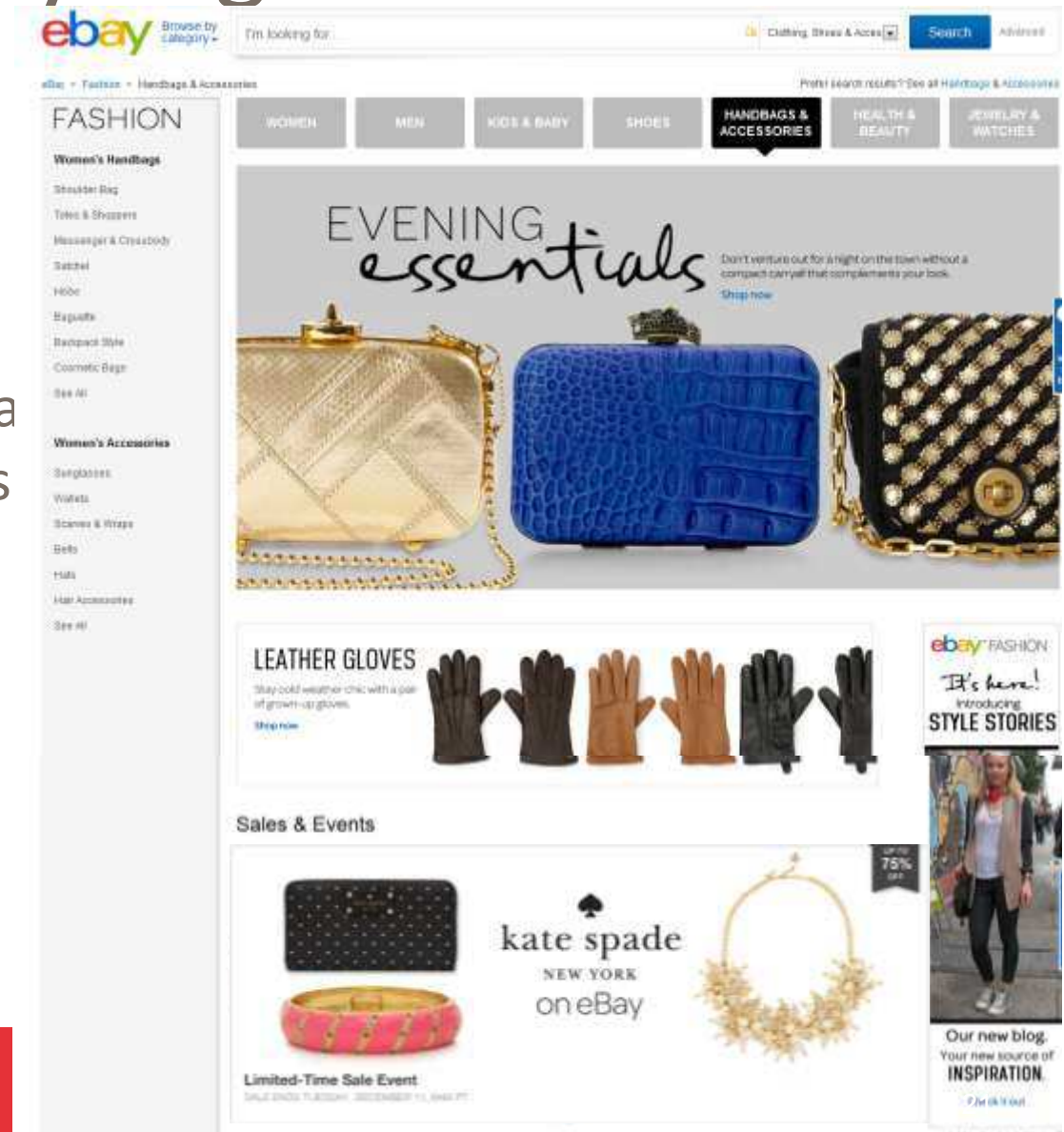
- Targeted to invited users and Fashion eBay buyers



Fashion Category Pages

Banner shown on Fashion category pages for main, handbags, women, J&W:

- Targeted to invited users and Fashion eBay buyers

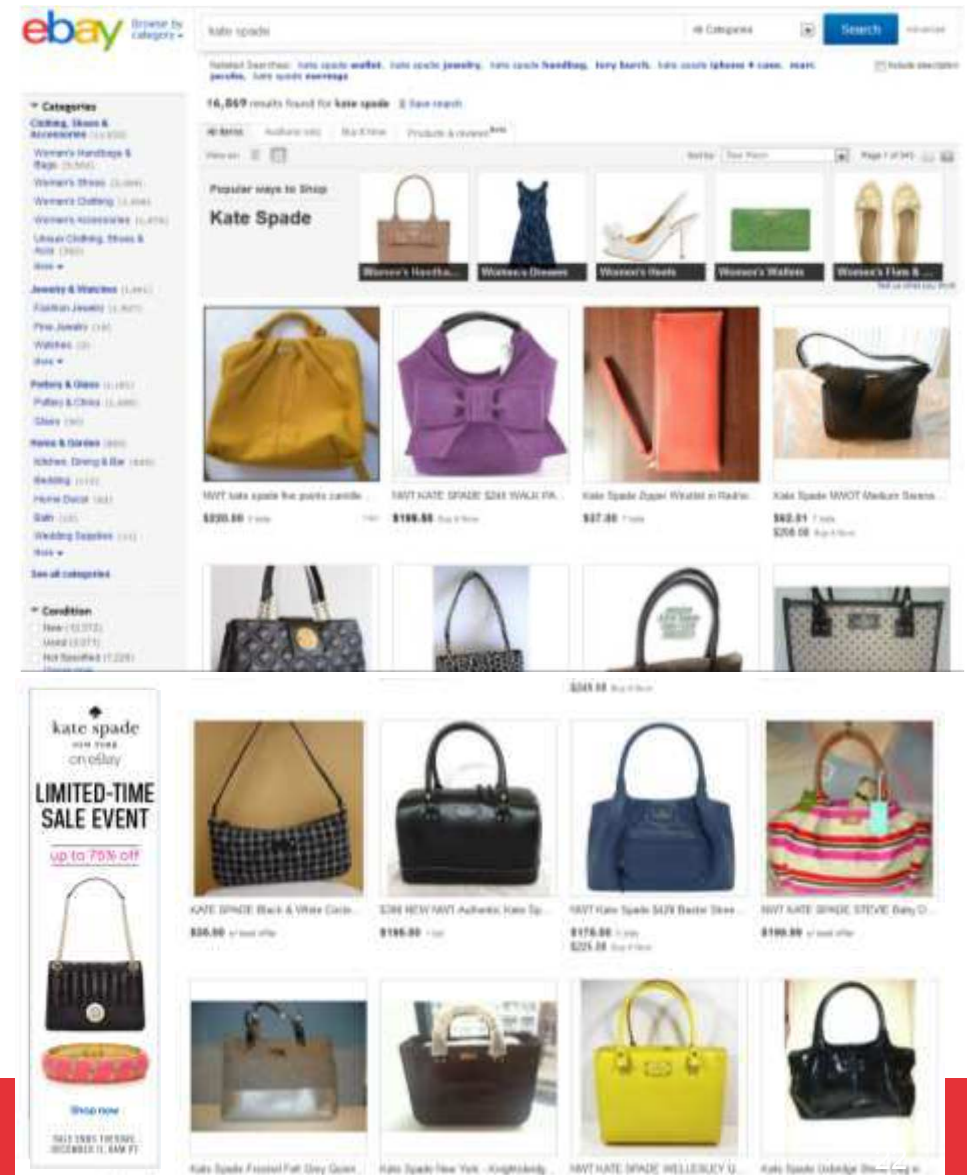


ebay™

Ad Placements

Ads shown on eBay Fashion
search results pages
and view item pages

- Targeted to invited users and Fashion eBay buyers



My eBay

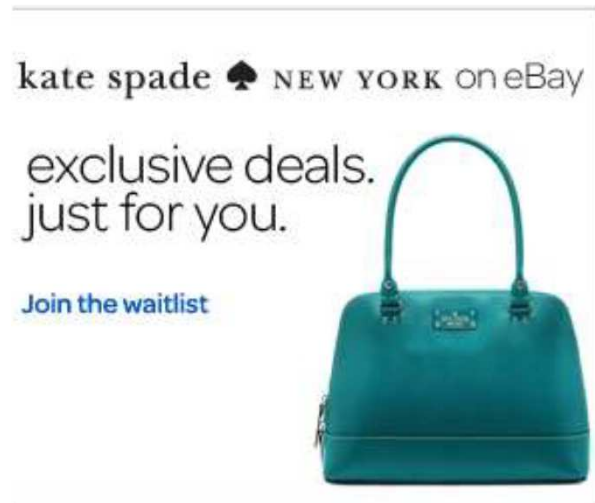
Small ad in the My eBay section of user's accounts:

- Targeted to invited users and Fashion eBay buyers

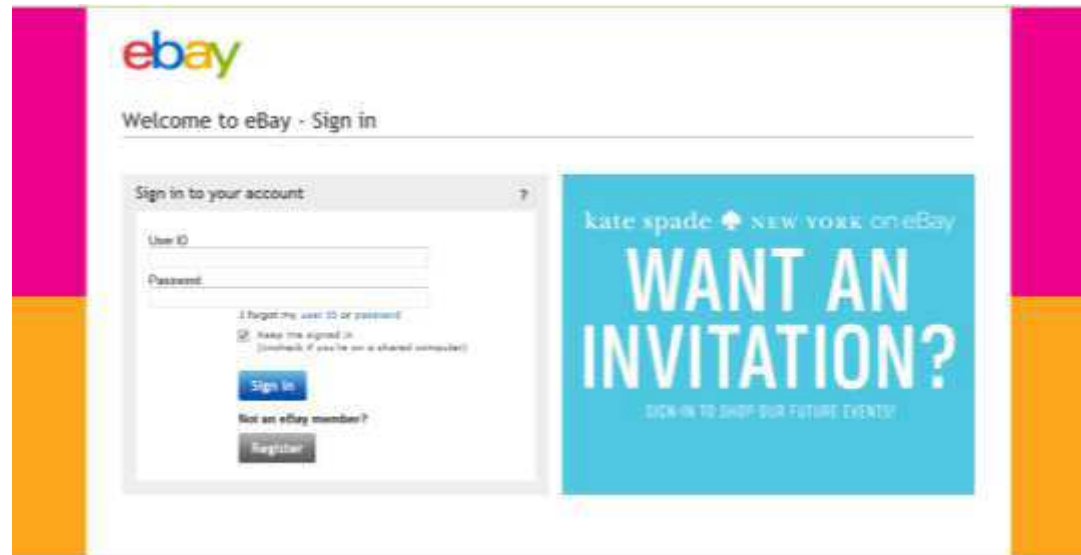


Waitlist Ads Opt-in User Flow

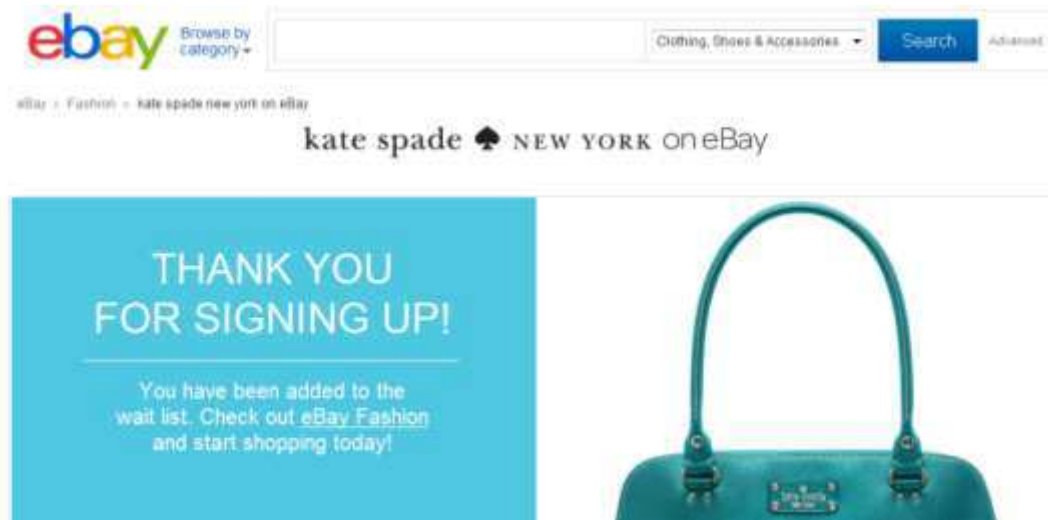
Waitlist ad



eBay Sign-in



Opt-in Success



eBay.com Top Search Banner Ad

Kate Spade Related Searches: Placement triggered by selected item/ brand keywords

Example Searches: kate spade wallet, kate spade watch, kate spade accessories, kate spade necklace, kate spade rings, kate spade bracelet, kate spade cosmetic, kate spade earrings, kate spade chandelier, chandelier earring, tudor city

ebay Browse by category

Search: kate spade wallet All Categories Search

Related Searches: tory burch wallet, michael kors wallet, marc jacobs wallet, coach wallet, kate spade handbag, coupons, kate spade

1,259 results found for kate spade wallet Save search

All items Auctions only Buy It Now Products & reviews Beta

View as: Sort by: Best Match Page 1 of 26

kate spade NEW YORK on eBay Join the wait list

KATE SPADE black patent leather B...

KATE SPADE EMERALD AVENUE ...

NWT Authentic Kate Spade Grant P...

Black Leather Purse / Mini V \$3.86 See suggestion

ebay

25

eBay.com Homepage Ad

Ad rotating on eBay.com with other ad content to fashion shoppers.

The screenshot shows the eBay.com homepage with a prominent banner for Toys R Us. The banner features the text "Take 25% OFF the top toys of the season from Toys R Us on eBay" and a "START SHOPPING" button. To the left of the banner is a sidebar with a "Browse by category" dropdown and a list of categories: All Categories, Fashion, Motors, Electronics, Collectibles & Art, Home, Outdoors & Decor, Entertainment, Deals & Gifts, Toys & Hobbies, and Sporting Goods. Below the banner, there are three sections: "Recently viewed items" showing a FILA Women's Tennis Baseline Dress for \$26.99, "Your recent searches" listing items like "kate spade" and "handbags", and a "Sign in" section with "Sign in" and "Register" buttons. On the right side, there is an advertisement for "The Business Gold Rewards Card" with an "OPEN" button. The bottom of the page features the eBay logo on the left and a red bar on the right.

ebay Browse by category

All Categories Search Advanced

All Categories > Fashion > Motors > Electronics > Collectibles & Art > Home, Outdoors & Decor > Entertainment > Deals & Gifts > Toys & Hobbies > Sporting Goods >

Take 25% OFF
the top toys of the season
from **Toys R Us** on eBay
START SHOPPING

1 2 3 4

Recently viewed items

< >

FILA Women's Tennis Baseline Dress
\$26.99
See suggestions | Remove all

Your recent searches

kate spade
handbags
kate spade cosmetic
leather wallet
kate spade new bond
kate spade cobble
kate spade baxter street
Remove searches

Sign in

Back for more fun? Sign in now to buy, bid and sell, or to manage your account.
Sign in

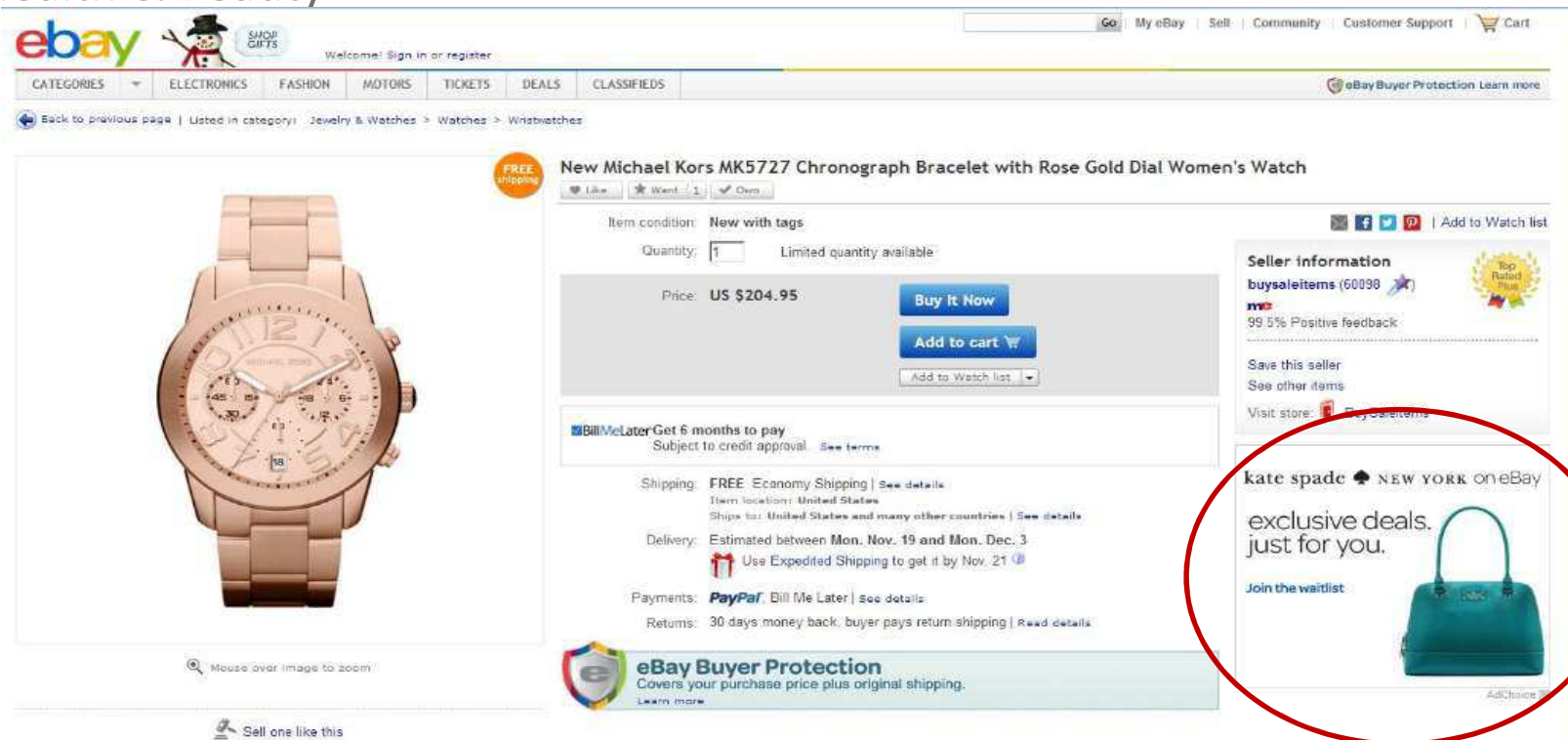
Not registered yet?
Join the millions of people who are already a part of the eBay family.
Register

The Business Gold Rewards Card
OPEN
AdChoice

View Item Pages

“Join Waitlist” Ads rotating on various view item pages for:

- Clothing, shoes & accessories (includes handbags, ksny items, etc)
- Jewelry & Watches
- Health & Beauty

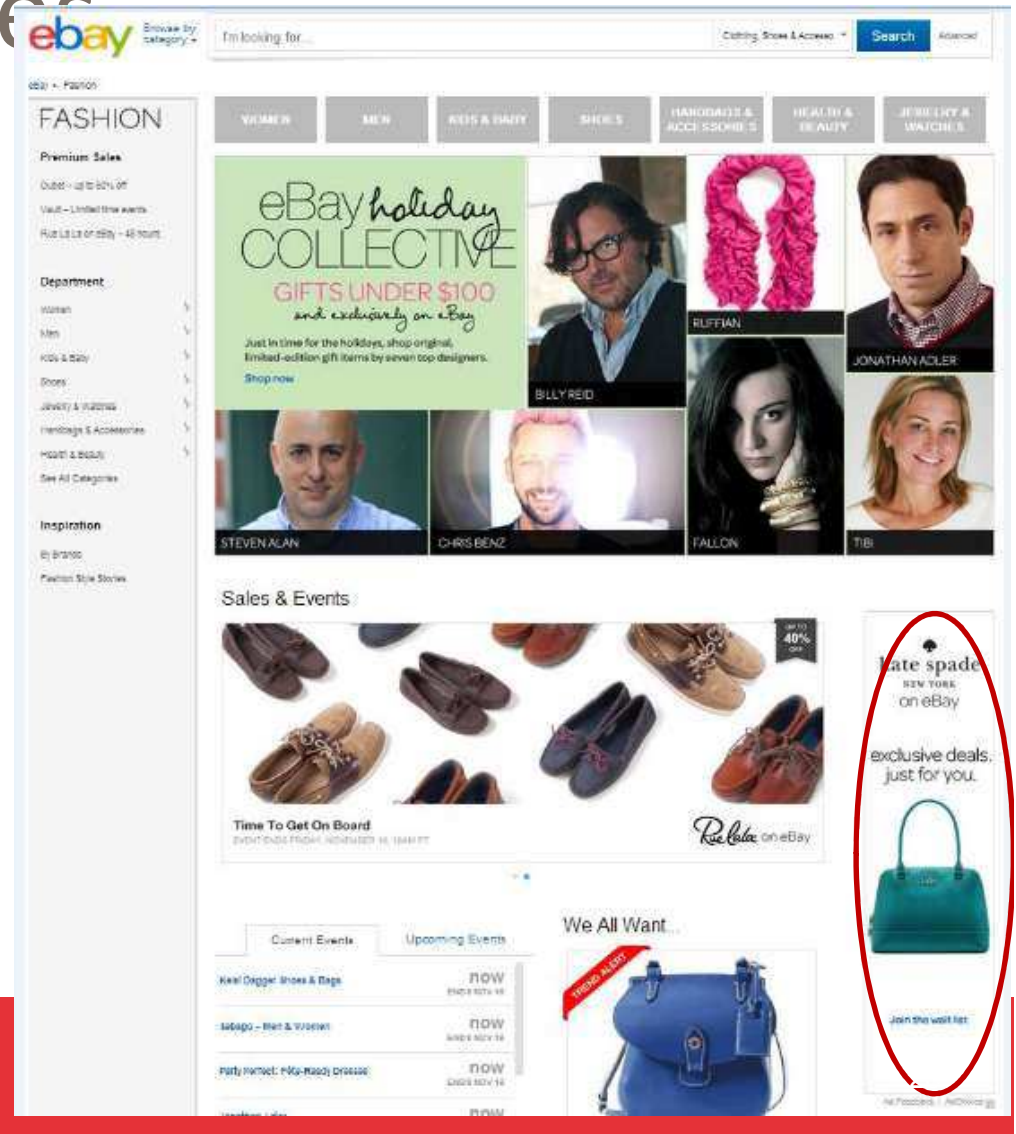


eBay Fashion Homepage and Category Pages

“Join Waitlist” ad on eBay Fashion homepage and following category pages:

- women’s,
- handbags
- jewelry & watches

Note: ad rotates with other content (not triggered on every visit to these pages)



eBay Search Results Page Ads

“Join Waitlist” ads trigger for users who are browsing relevant categories on eBay:

- Handbags
- Accessories
- Jewelry & Watches
- Clothing
- Shoes

Note: ad is rotating with other ad content does not trigger for every search

