

MIS 0855 Fall 2016 – Data Science *Week 9 – Key Performance Indicators*

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How would you measure performance of

- a baseball player?
- What would be the *key performance indicators* (KPI)?



<https://www.gobigrecruiting.com/blog/2014/03/kind-baseball-players-colleges-looking/>

How would you measure performance of

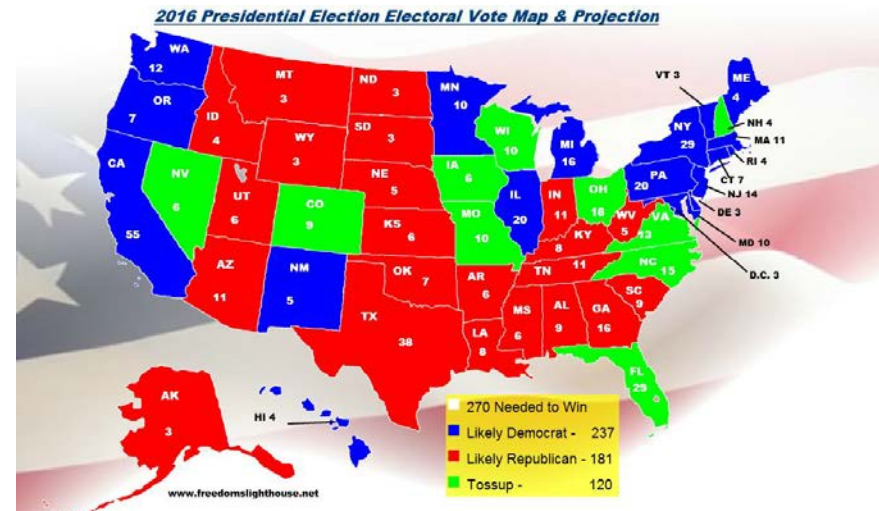
- a police department?
- What would be the KPIs?



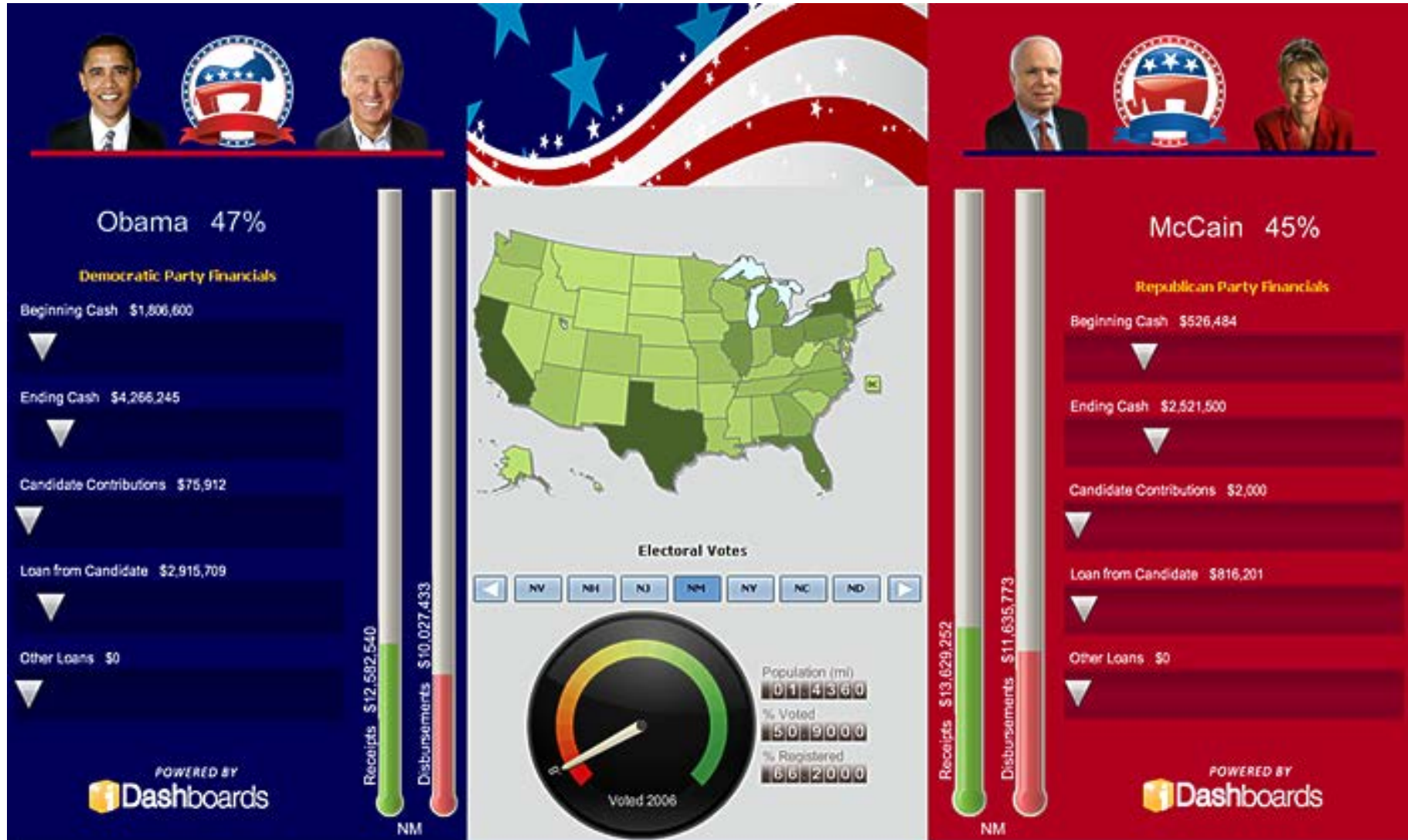
http://articles.glendalypress.com/2011-09-25/news/tn-gnp-0925-canines_1_police-dogs-third-dog-glendale-k-9s

How would you measure performance of

- a political campaign (before the election)?
- What would be the KPIs?



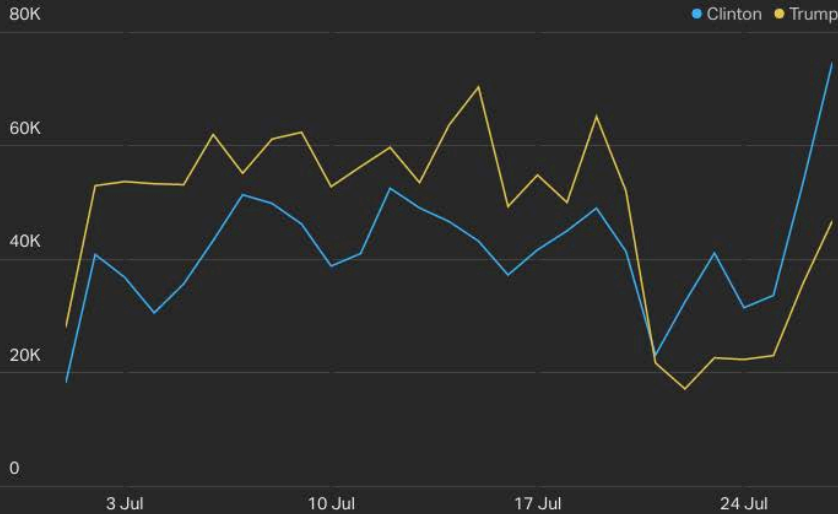
<http://freedomslighthouse.net/election/2014-2016/2016-presidential-election-electoral-vote-map-polls-projections/>



<http://www.dashboardinsight.com/dashboards/operational/us-election-2008-the-presidential-decision.aspx>

The Social Media Race for the White House - 2016

Daily Social Mentions



Clinton - Hourly Social Sentiment

-11%

▼ 11%



Trump - Hourly Social Sentiment

-33.2%

▲ 10.5%

Presidential Election News

[Celebrities use platform to speak up about presidential election - 6abc.com](#)

28th July, 5:45 am

[What Comic-Con Tells Us About the Presidential Election - TIME](#)

26th July, 2:42 pm

Latest "Clinton" Tweets

[@erikaberry644](#): RT [@cuban2hot](#): Shady ass Clintons check out the real #CrookedHillary biography explained by ultimate Clinton insider turned rogue [https://t.co/...](#)

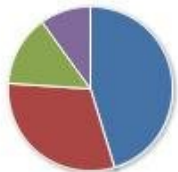
Latest "Trump" Tweets

[@ivanmagallonga](#): RT [@PeterHamby](#): It [@BLABBERMOUTHNET](#): RED HOT CHILI PEPPERS Singer Calls TRUMP And CLINTON 'Tyrants' better will ever read [https://t.co/XVYltG8rwy](#)

ELECTION DASHBOARD 2012

Countdown to Election

7 Months 23 Days 0 Hours 37 Minutes 42 Seconds



Mitt Romney

Newt Gingrich

Rick Santorum

Ron Paul



Like

1751527

295871

190613

933149



Followers

430117

1466518

205695

278146



Blogs

25800000

10% 49% 41%



Sentiment Index

13100000

41% 50% 9%



Sentiment Index

28600000

82% 9% 9%



Sentiment Index

33800000

29% 15% 56%



Sentiment Index



News

40562

16% 49% 35%



YouTube | Newspaper | Media

21196

74% 20% 6%



YouTube | Newspaper | Media

35300

67% 15% 18%



YouTube | Newspaper | Media

26561

29% 54% 17%



YouTube | Newspaper | Media



Maps



How would you measure performance of

- a hospital?
- What would be the KPIs?



Table 3. Examples of Measures in Various Dashboard Sets at Legacy Health System*

Customer Service Dashboard	Clinical Dashboard	Key Process Dashboard
<ul style="list-style-type: none"> ■ Percent who recommend Legacy Health System to others 	<ul style="list-style-type: none"> ■ Mortality rate 	<ul style="list-style-type: none"> ■ Percentage of transfusions having reactions
<ul style="list-style-type: none"> ■ Percent rating "5" (excellent) on survey items 	<ul style="list-style-type: none"> ■ Quality improvement 	<ul style="list-style-type: none"> ■ Accurate performance of transfusion protocols
<ul style="list-style-type: none"> ■ Inpatient satisfaction with 	<ul style="list-style-type: none"> ■ Readmission rate 	<ul style="list-style-type: none"> ■ Adverse drug reactions
<ul style="list-style-type: none"> <input type="checkbox"/> Parking 	<ul style="list-style-type: none"> ■ Central venous catheter infection rates 	<ul style="list-style-type: none"> ■ Medicine error severity ratio
<ul style="list-style-type: none"> <input type="checkbox"/> Courtesy of staff 	<ul style="list-style-type: none"> ■ ORYX measures for acute care 	<ul style="list-style-type: none"> ■ Autopsy rate
<ul style="list-style-type: none"> <input type="checkbox"/> Cleanliness 	<ul style="list-style-type: none"> ■ CABG mortality rates 	<ul style="list-style-type: none"> ■ Correlation between pathology reports and autopsy findings
<ul style="list-style-type: none"> <input type="checkbox"/> Caring of staff 	<ul style="list-style-type: none"> ■ Aspirin administration within 24 hours postMI 	<ul style="list-style-type: none"> ■ Employee exposures to blood and bodily fluids
<ul style="list-style-type: none"> <input type="checkbox"/> Quality of meals 	<ul style="list-style-type: none"> ■ Positive blood cultures in NICU 	<ul style="list-style-type: none"> ■ Hours of emergency room diversion
<ul style="list-style-type: none"> <input type="checkbox"/> Follow-up education and instruction 	<ul style="list-style-type: none"> ■ Birth trauma among high-risk women 	<ul style="list-style-type: none"> ■ Code response time
<ul style="list-style-type: none"> <input type="checkbox"/> Pain management 	<ul style="list-style-type: none"> ■ C-section rates 	<ul style="list-style-type: none"> ■ Restraint use rates
<ul style="list-style-type: none"> <input type="checkbox"/> Overall satisfaction 	<ul style="list-style-type: none"> ■ C-section infection rates 	<ul style="list-style-type: none"> ■ Specimen rejection rates
	<ul style="list-style-type: none"> ■ Surgical site nosocomial infection rates 	<ul style="list-style-type: none"> ■ Abnormal mammogram turn-around time
	<ul style="list-style-type: none"> ■ Stage of cancer at diagnosis 	

* CABG, coronary artery bypass graft; MI, myocardial infarction; NICU, neonatal intensive care unit; C-section, cesarean section.

Criteria for Good KPI – S.M.A.R.T (1/2)

- **Specific**
- **Measurable**
- **Achievable**
- **Relevant to success**
- **Time-phased**



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<http://www.shutterstock.com/pic-69572626/>

Criteria for Good KPI – S.M.A.R.T (1/2)

Specific	The goal should state the exact level of performance expected.
Measurable	The progress should be able to observed and measured.
Achievable	The goals should be realistically achievable.
Relevant	Measures need to pertain directly and significantly to the performance challenge being managed.
Time-phased	There should exist a timeframe for the goal to be achieved.

Why should KPIs be SMART?

- What would happen if I gave A to all students?
- What would be the purpose of performance measurement?
 - to measure past performance
 - to reward good performance and to discipline bad one
 - to motivate for improvement in future performance
- For these purposes, KPIs need to be fair, objective, realistic, and relevant.





Bad and Good KPIs

Bad	To introduce new products/service
Good	To introduce 4 new products/services by the end of 2015
Bad	To maximize customer satisfaction
Good	To increase customer satisfaction ratings to 90% by the end of Q3 in 2011
Bad	To reduce re-work in factories
Good	To achieve a 10% reduction in re-work within 6 months
Bad	To achieve market share growth
Good	To increase our market share in 2008 by 3% over 2006 level

Manipulation of Performance Indicators

- How can a hospital manipulate mortality rate or readmission rate?
- If a flight delay is defined as an arrival more than 15 minutes after scheduled, how can an airline manipulate the delay?