

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

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Oct. 27th, 2016

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?



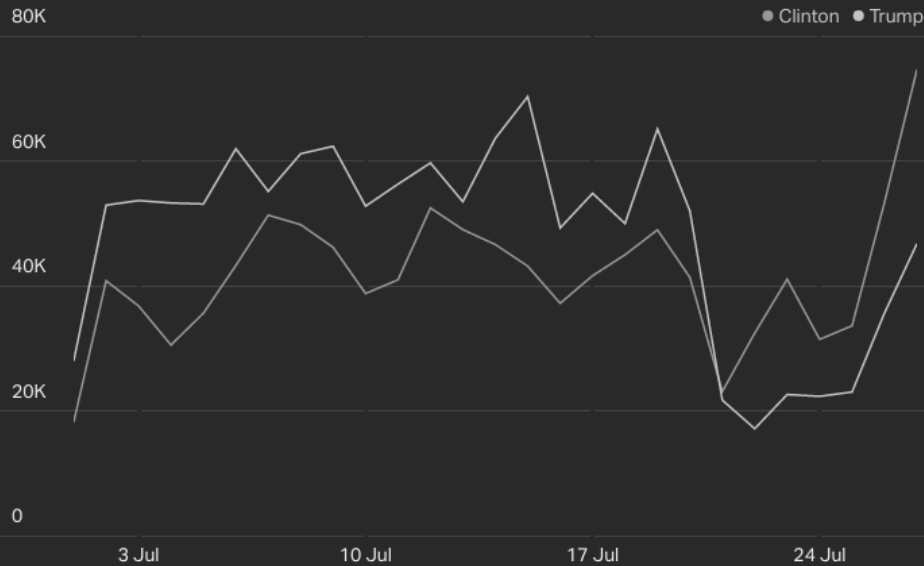
<http://freedomslighthouse.net/election/2014-2016/2016-presidential-election-electoral-vote-map-polls-projections/>



<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 reals #CrookedHillary biography explained by ultimate Clinton insider turned rogue

[https://www.fox.com/...](#)
a few seconds ago

Latest "Trump" Tweets

@ivanmagallonga: RT @PeterHamby: It @BLABBERMOUTHNET: RED HOT CHILI PEPPERS Singer Calls TRUMP And CLINTON 'Tyrants' orner will ever read















[https://t.co/XVYltG8rwz](#)
[https://t.co/4uqRCS617Y](#)

<https://www.geckoboard.com/blog/track-the-role-of-social-media-in-the-2016-presidential-election-campaign-for-free/>

ELECTION DASHBOARD 2012

Countdown to Election

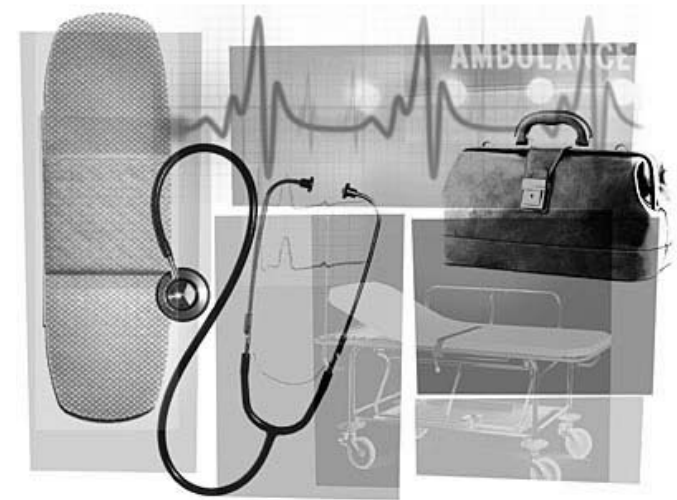
7 Months 23 Days 0 Hours 37 Minutes 42 Seconds

					
		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% YouTube 49% Newspaper 35% Media	21196 74% YouTube 20% Newspaper 6% Media	35300 67% YouTube 15% Newspaper 18% Media	26561 29% YouTube 54% Newspaper 17% Media
 Maps					

<http://sourceforge.net/projects/electdashboard/>

How would you measure performance of

- a hospital?
- What would be the KPIs?



<http://news.health.com/2012/12/02/25-worst-hospitals-in-the-u-s-is-yours-on-the-list/>

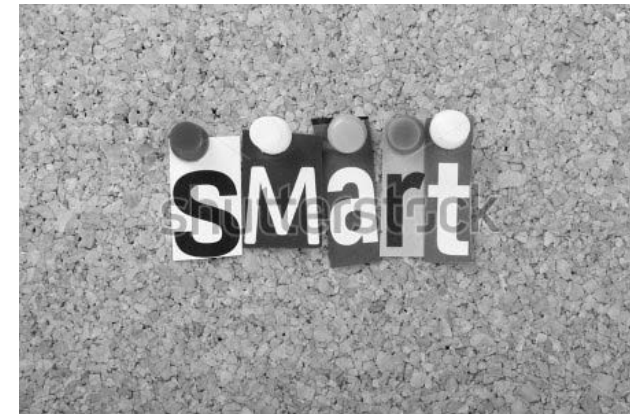
Table 3. Examples of Measures in Various Dashboard Sets at Legacy Health System*

Customer Service Dashboard	Clinical Dashboard	Key Process Dashboard
■ Percent who recommend Legacy Health System to others	■ Mortality rate	■ Percentage of transfusions having reactions
■ Percent rating "5" (excellent) on survey items	■ Quality improvement	■ Accurate performance of transfusion protocols
■ Inpatient satisfaction with	■ Readmission rate	■ Adverse drug reactions
□ Parking	■ Central venous catheter infection rates	■ Medicine error severity ratio
□ Courtesy of staff	■ ORYX measures for acute care	■ Autopsy rate
□ Cleanliness	■ CABG mortality rates	■ Correlation between pathology reports and autopsy findings
□ Caring of staff	■ Aspirin administration within 24 hours postMI	■ Employee exposures to blood and bodily fluids
□ Quality of meals	■ Positive blood cultures in NICU	■ Hours of emergency room diversion
□ Follow-up education and instruction	■ Birth trauma among high-risk women	■ Code response time
□ Pain management	■ C-section rates	■ Restraint use rates
□ Overall satisfaction	■ C-section infection rates	■ Specimen rejection rates
	■ Surgical site nosocomial infection rates	■ Abnormal mammogram turn-around time
	■ 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?