# Quantifying Music

Tom Gilb

Lightening Talk at ACCU 2012

# What is the problem, in quantifying music?

- *Can you quantify this music?*

# Lean QA Audience at ACCU
# "Surely you cannot quantify 'Music' ?"

- I claimed
  - we can quantify any variable quality of any system

- I replied:
  - *I'll do it in a lightening talk here at ACCU*

# Black-Eyed Peas song "I gotta Feeling" gets 8.9 of 10 from Hit Song Science software



Frank Micelotta/Getty Image

The Black Eyed Peas' single "I Gotta Feeling" received a hit score of 8.9 out 10 with Music Intelligenc Solutions' new software Hit Song Science.

# "There's no magic in that; it's math"



"[It's] a series of **algorithms that we us**e to look at what's **the potential of a song** to **be sticky with a listener** ... To have **those patterns in the music** that would *correspond* with what **human brain waves would find pleasing**"

CEO David Meredith

A study conducted by the Harvard Business School found that the software **was accurate 8 out of 10 times**

http://www.npr.org/templates/story/story.php?storyId=113673324

# Measurable Attributes of Hits

Meredith says his software evaluates songs over sixty elements including

| | |
|---|---|
| **Melody** | **Rhythm** |
| **Harmony** | **Fullness of sound** |
| **Tempo** | **Noise** |
| **Pitch** | **Brilliance** |
| **Octave** | **Chord progression** |
| **Beat** | |



http://edition.cnn.com/2008/WORLD/europe/03/07/spiritof.music/

# Evaluation by what people buy and industry awards

Top Ten
Scale: Number of sales in a given time period

iTune Downloads
Scale: Number of sales in a given time period

Silver, Gold and Platinum Discs
Awarded when total number of sales reach specific levels

Industry Awards
Scale: Percentage of the major awards recognising the music in a defined [manner: default=won]

# So How Did "I Gotta Feeling" Do?

- The song reached number one on the US charts and 20 charts worldwide

- "I Gotta Feeling" spent fourteen consecutive weeks atop the Billboard Hot 100, the longest-running number-one single of 2009

- "I Gotta Feeling" was 5th on the Billboard Hot 100 Songs of the Decade

- In March 2011, it became the first song in digital history to sell over 7 million digital copies in the United States. Worldwide it has sold over 14 millions units, becoming one of the most successful songs in the history of popular music

- "I Gotta Feeling" holds the record as the most downloaded song on iTunes of all time

- The song was nominated for Record of the Year at the 52nd Grammy Awards and won the Grammy for Best Pop Performance by a Duo or Group with Vocals

- The song was nominated as Song of the Year at the 2009 World Music Awards

# YouTube Measures

- Number of Likes and Dislikes

  11,021 Likes, 371 Dislikes (April 26, 2012)

- Number of times video has been viewed

  5,942.649 Views (April 26, 2012)
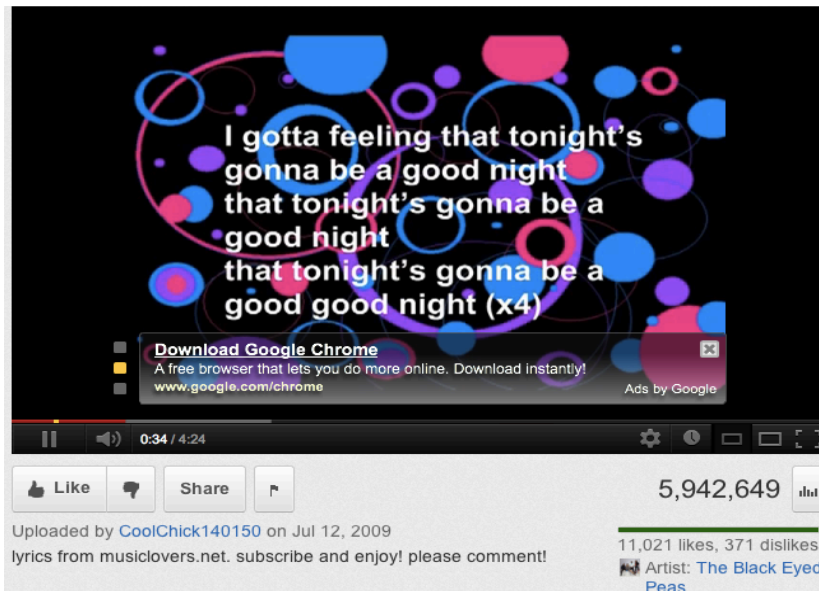
# Jeremy Yudkin
## Boston University Professor

Great music is about

- Deception: the creating and violating of expectations

- Concision: content against time

"Not a note too many, not a second too long"

http://www.bu.edu/cfa/music/faculty/yudkin/

# By **Survey**: Most Wanted Attributes

- Yudkin reports on a web-based survey into American musical tastes conducted by Komar and Melamid in 1996

- If you want to please the greatest number of Americans (72% ± 12%) consider
  - Male and female solo voices
  - R&B with a love theme
  - Small ensemble of musicians
  - Length of about 5 minutes
  - Moderate pitch, tempo and volume

  http://www.bu.edu/cfa/music/faculty/yudkin/

# Most Unwanted Attributes

To appeal to only about 200 Americans

- Extreme length
- Wide range of dynamics, tempo and pitch in abrupt succession
- An operatic soprano singing atonally
- A cowboy song with political slogans
- A children's choir singing holiday songs
- Large orchestra featuring harp, accordion and bagpipes

http://www.bu.edu/cfa/music/faculty/yudkin/

*There are samples of two songs written by David Soldier with lyrics by Nina Mankin to these wanted and unwanted guidelines about 19 minutes into Yudkin's lecture*

# Stakeholders and Context

Yudkin stresses the importance of the listener

Tastes change

- Over historical time
  - Bach was thought less of in his day than some other musicians we have forgotten
  - People used to have more time - concerts could last four hours
  - Less technology – limited access and not the ability to listen to background music so easily
- Over personal time (during one's lifetime and its influenced by experience)

http://www.bu.edu/cfa/music/faculty/yudkin/

# Some potentially quantifiable Quality dimensions of Music

## Brainstormed by Steve F. and Rachel D. At lunch

- In tune
- Applause
- Moving
- Encores
- Repeat Gigs
- Busking Hat Collection
- MRI Brain Scan
- Downloads
- Utube Reviews
- Royalties
- …   (many more!!)

## Examples in Planguage

- **Music.Moving:**

- **Type:** primary music quality attribute

- **Ambition Level: the majority of listeners feel moved to tears or strong physical emotional reactions.**

- **Scale: the % of defined [Listeners] hearing defined [Music] under defined [Environments] who reports a defined [Emotion] at a defined [Strength]**

- **Goal [1st UK Release, Music = Hip Hop, Environment = Itunes, Emotion = {Tears, Sadness}, Strength = Powerful]**

# Conformance to music standards

- In tune
- Standard tempo
- Fit to genre

# Worrying about the **Process**
## - the Qualities of the Performance

- The musicians involved
- The conductor
- The instruments
- The version of the music
- The location's acoustics
- The accuracy of the recording
- The accuracy of the playback

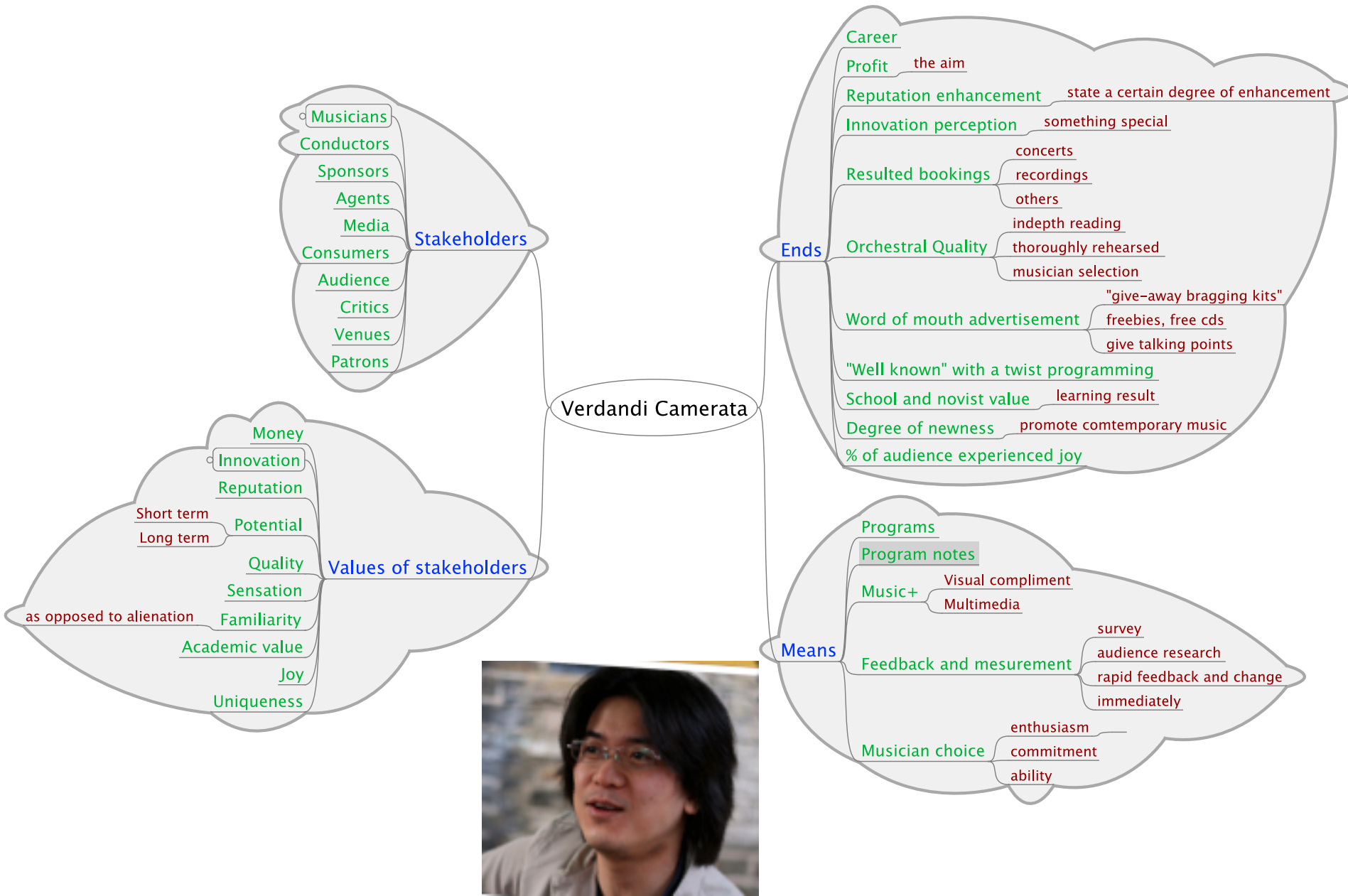# The **Costs and Budgets**
# - What will people pay?

- What price to set up a performance?

- What will you pay for a ticket to attend?

- How far will you travel?

- How much do you spend on your hi-fi?

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# My friend "Uyen" The Conductor



Verdandi Camerata

**Stakeholders**
- Musicians
- Conductors
- Sponsors
- Agents
- Media
- Consumers
- Audience
- Critics
- Venues
- Patrons

**Values of stakeholders**
- Money
- Innovation
- Reputation
- Potential
  - Short term
  - Long term
- Quality
- Sensation
- Familiarity — as opposed to alienation
- Academic value
- Joy
- Uniqueness

**Ends**
- Career
- Profit — the aim
- Reputation enhancement — state a certain degree of enhancement
- Innovation perception — something special
- Resulted bookings
  - concerts
  - recordings
  - others
- Orchestral Quality
  - indepth reading
  - thoroughly rehearsed
  - musician selection
- Word of mouth advertisement
  - "give-away bragging kits"
  - freebies, free cds
  - give talking points
- "Well known" with a twist programming
- School and novist value — learning result
- Degree of newness — promote comtemporary music
- % of audience experienced joy

**Means**
- Programs
- Program notes
- Music+
  - Visual compliment
  - Multimedia
- Feedback and mesurement
  - survey
  - audience research
  - rapid feedback and change
  - immediately
- Musician choice
  - enthusiasm
  - commitment
  - ability

# The Music Conductor's Quantifiable 'Music' Objectives: Uyen's Goals

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# Uyens Concert Sunday

# Uyen taking Applause at Concert

# What is the problem, in quantifying music?

- Next!

So who was the man who challenged me to quantify music?

Are you happy yet?

# Thanks

- To [neil.hankey@igence.com](mailto:neil.hankey@igence.com)

For immediately finding me some of these examples, as our class ended!

- To Steve F. and Rachel D.

  For brainstorming some ideas over lunch

# End