Understanding Quantified-Selfers’ Practices in Collecting and Exploring Personal Data

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Countless Self-monitoring Apps
Activity Sensing

- Blood glucose meter
- Thermometer
- Blood pressure monitor
- Heart Rate monitor

Medical Sensing
Apple’s Healthbook
Few good self-monitoring tools exist
Extreme self-trackers

- Activity
- Sleep
- Heart rate
- Location
- Food
- Mood
- Weight
- Snoring
- Cognitive performance

Quantified Self
self knowledge through numbers
Mark Moschel on Tracking and Dunking

Posted on January 30, 2014 by Ernesto Ramirez

Since he was a child Mark Moschel has been a basketball fan. Growing up in Chicago he became a fan of Michael Jordan. What really captured his attention was the act of dunking a basketball. As an adult, and still a basketball fan, Mark decided he wanted to set a new goal for himself – learning to dunk a basketball. In this talk, presented at our 2013 Global Conference, Mark describes how he incorporated self-tracking in his efforts.
Quantified Self Meetup Groups

Groups 165  Members 30,967  Interested 8,392

Cities 118  Countries 38

Related topics: Self Tracking · Personal Informatics · The Quantified Self · New Technology · Innovation · Mobile Technology · Big Data · Entrepreneurship · Startup Businesses
What I Learned

- What a good night's sleep looks like and what affects that for me

1. What I did
2. How I did it
3. What I learned
What do we want to know about QS?

Profile
Motivation
Tools
Challenges
Workarounds
Visualizations
Dataset

Number of Video Posts in the Quantified Self Blog per year

52 videos met the inclusion criteria
Average length: 15 minutes 53 seconds
Analysis

Affinity analysis
## Analysis

<table>
<thead>
<tr>
<th></th>
<th>City</th>
<th>Gender</th>
<th>Background</th>
<th>Data type</th>
<th>Technology for collecting data</th>
<th>Health Condition</th>
<th>Duration</th>
<th>User-generated?</th>
<th>Commercial?</th>
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<tbody>
<tr>
<td>2</td>
<td>San Francisco</td>
<td>Male</td>
<td>Microsoft</td>
<td>Activity, Food, Sleep, Weight, Body fat, mood</td>
<td>Fitbit, Wireless weight scale</td>
<td>Obesity</td>
<td>15 weeks</td>
<td></td>
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<td>3</td>
<td>San Francisco</td>
<td>Male</td>
<td>startup</td>
<td>Data analytics, financial modeling, tech startup</td>
<td>Continuous glucose monitor</td>
<td>Diabetes</td>
<td>2 years</td>
<td></td>
<td>Commercial</td>
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<tr>
<td>4</td>
<td>London</td>
<td>Male</td>
<td>no</td>
<td>electronics engineer</td>
<td>heart rate monitor, pen and paper, Excel</td>
<td>cancer</td>
<td>6 years</td>
<td></td>
<td>Commercial</td>
</tr>
<tr>
<td>5</td>
<td>Seattle</td>
<td>Male</td>
<td>startup</td>
<td>interface designer, VP of product, web development</td>
<td>scale, Fitbit, RescueTime (productivity measuring tool)</td>
<td>overweight</td>
<td>2 years</td>
<td></td>
<td>Commercial</td>
</tr>
<tr>
<td>6</td>
<td>London</td>
<td>Male</td>
<td>startup</td>
<td>software engineer, network engineer</td>
<td>arduino, spreadsheet</td>
<td>overweight</td>
<td>5 months</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>San Francisco</td>
<td>Male</td>
<td>startup</td>
<td>robotics, software, product development</td>
<td>proximity to cars, location</td>
<td>smartphone, sonar, custom heart rate monitor</td>
<td>1 year</td>
<td></td>
<td>user-generated</td>
</tr>
<tr>
<td>8</td>
<td>Beirut</td>
<td>Female</td>
<td></td>
<td>mechanical engineer</td>
<td>heart rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Toronto</td>
<td>Male</td>
<td>Rogers</td>
<td>programmer, performance manager, big data</td>
<td>food, fitness, cognitive performance, anxiety, media consumption, sleep, location, finance, biomedical data, reading, glucose</td>
<td></td>
<td>20 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Analysis

Categorize visualizations by type
Results
1. What did you do?
- Profiles
- Items Tracked
- Motivations to Practice Self-Tracking

2. How did you do it?
- Data Collection & Exploration Tools
- Visualization Types
- Building Custom Tools
- Self-Experimentation

3. What did you learn?
- Gained Insights
- Tracking Outcomes
- Challenges and Workarounds

1,2,3
1. What did you do?

Items Tracked

Number of People Who Tracked A Certain Item

Top 5 items: activity, food, weight, sleep, and mood

Other items: cognitive performance, blood glucose, location, heart rate, knowledge, stress, body fat, productivity, snoring, movies, posture, medicine, skin condition, home energy usage, clothes, and public transit usage
“Movies seen in theaters (since 2001)”
“Clothing logs”
1. What did you do?

Titles of the talk:

A Diabetic Experience with Self-Quantification
Analyzing My Cancer Data
Going Vegan in December
Improving Skin Health…
Cognitive Performance
15 Weeks of Self-Tracking
Diabetes, Exercise, and QS
Experience Sampling of My Stress
Hacking Your Subconscious Mind
…
Motivations to Self-Tracking

<table>
<thead>
<tr>
<th>Motivations</th>
<th>Sub-categories</th>
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</thead>
<tbody>
<tr>
<td>To improve health</td>
<td>To cure or manage a condition</td>
</tr>
<tr>
<td></td>
<td>To achieve a goal</td>
</tr>
<tr>
<td></td>
<td>To find triggers</td>
</tr>
<tr>
<td></td>
<td>To answer a specific question</td>
</tr>
<tr>
<td></td>
<td>To identify relationships</td>
</tr>
<tr>
<td></td>
<td>To execute a treatment plan</td>
</tr>
<tr>
<td></td>
<td>To make better health decisions</td>
</tr>
<tr>
<td></td>
<td>To find balance</td>
</tr>
<tr>
<td>To improve other aspects of life</td>
<td>To maximize work performance</td>
</tr>
<tr>
<td></td>
<td>To be mindful</td>
</tr>
<tr>
<td>To find new life experiences</td>
<td>To satisfy curiosity and have fun</td>
</tr>
<tr>
<td></td>
<td>To explore new things</td>
</tr>
<tr>
<td></td>
<td>To learn something interesting</td>
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## Data Collection and Exploration Tools

### Data Collection Tool

<table>
<thead>
<tr>
<th>Tool</th>
<th>%</th>
<th>(#)</th>
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<tbody>
<tr>
<td>Commercial hardware</td>
<td>56%</td>
<td>(29)</td>
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<tr>
<td>Spreadsheet</td>
<td>40%</td>
<td>(21)</td>
</tr>
<tr>
<td>Custom software</td>
<td>21%</td>
<td>(11)</td>
</tr>
<tr>
<td>Pen and paper</td>
<td>21%</td>
<td>(11)</td>
</tr>
<tr>
<td>Commercial software</td>
<td>19%</td>
<td>(10)</td>
</tr>
<tr>
<td>Commercial website</td>
<td>10%</td>
<td>(5)</td>
</tr>
<tr>
<td>Camera</td>
<td>6%</td>
<td>(3)</td>
</tr>
<tr>
<td>Open-source platform</td>
<td>6%</td>
<td>(3)</td>
</tr>
<tr>
<td>Custom hardware</td>
<td>4%</td>
<td>(2)</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
<td>(5)</td>
</tr>
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</table>

### Data Exploration Tool

<table>
<thead>
<tr>
<th>Tool</th>
<th>%</th>
<th>(#)</th>
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</thead>
<tbody>
<tr>
<td>Spreadsheet</td>
<td>44%</td>
<td>(23)</td>
</tr>
<tr>
<td>Custom software</td>
<td>35%</td>
<td>(18)</td>
</tr>
<tr>
<td>Commercial website</td>
<td>27%</td>
<td>(14)</td>
</tr>
<tr>
<td>Commercial software</td>
<td>12%</td>
<td>(6)</td>
</tr>
<tr>
<td>Open-source platform</td>
<td>8%</td>
<td>(4)</td>
</tr>
<tr>
<td>Statistical software</td>
<td>4%</td>
<td>(2)</td>
</tr>
<tr>
<td>Pen and paper</td>
<td>2%</td>
<td>(1)</td>
</tr>
</tbody>
</table>
Building custom tools

Captures smile via wearable sensing
Provides real-time feedback

Captures snoring via mobile app
Provides data visualization
Visualization Types

Tag cloud showing the usage frequency of 21 unique visualization types
2. How did you do it?

Custom visualizations
Why build custom tools?

Desirable features are not supported

Collect and reflect on the data using a single tool

Perform self-experimentation
Challenges & Workarounds
Tracking too many things

“I can honestly say that I’ve made the classic newbie self-tracking mistake which is that I track everything. I didn't know exactly what to track, so I tracked caffeine, dairy, wheat, sugar, nuts, fruit, vegetables, meat, chicken, fish, alcohol supplements…”

Ways to lower the manual capture burden:
- lower the data granularity (e.g., binary rather than numeric )
- make manual capture very easy (e.g., single-tap)
- make tracking a rewarding experience
Challenges & Workarounds

Not tracking triggers & context

“I was trying to track all these symptoms and I was completely ignoring the cause…”

Not having enough clues on what to track
Missing vital information on how to improve outcome measure
Lacking scientific rigor

Conducted self-experimentations without having a control condition or controlling for confounding factors
Implications for self-tracking tools

- Help identify what to track and provide early feedback
- Help people conduct more rigorous self-experimentation
- Maximize the benefits of manual tracking
Takeaways
YOU ARE JUST A NUMBER

Can you make yourself healthier and happier by logging every snore, step and mood swing? As a Californian trend for obsessive data-tracking makes its way over here, Tim Chester covers his body in gadgets to find out if self-knowledge is power. Photograph by Paul Stuart

Today I have climbed the equivalent of a tall giraffe. Coffee is my most frequent food. On average, I walk 11,726 steps a day, burning 3,089 calories, over 24 hours of activity. I sleep for 6 hours and 9 minutes a night. This week, my sleep efficiency is 72% and my food is 77% healthy. My BMI of 23.5 is in the percentage points below the median for men my age, and my average daily Met score is 171, although I have no idea what a Met score is.

I am, it seems, nothing more than a bundle of numbers and milestones, spurred on by LEDs and chided by pop-up messages. A wireless accessory for the iPhone, perhaps its most sophisticated yet.

My ears are covered in bands, my pockets augmented with accelerometers, my eyes numb from all the charts, my heart pumping to the beat of a heart-rate monitor and forcing its vesticles to keep up with the national average. My head is about to implode from all the positive affirmation and gentle nudging, but it's OK because my memories are being saved to my hard drive and my mood swings are turning me "huge" from strangers.

I am producing, analysing and socially sharing personal data. I am becoming fitter, happier, and more productive. I am staying motivated by earning badges. I have become a Quantified Selfie (QS).

The QS movement that I've temporarily joined began as these things tend to do, in San Francisco's Bay Area in 2007. Two Wired magazine editors, Gary Wolf and Kevin

http://www.thetimes.co.uk
Support self-reflection
Thank you!

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