Enterprise Tuesday
Make it Brilliant and They Will Come
The story of Evi
10\textsuperscript{th} February 2015

William Tunstall-Pedoe
Evi (an Amazon company)
What is Evi?

- Company founded in Cambridge (as True Knowledge)
  - Full time effort from late 2005
- Automatic question-answering
- Multiple pivots
- Multiple rounds of angel/VC finance
- Successful acquisition by Amazon in late 2012
  - Evi is now a subsidiary of Amazon
  - Amazon now a major employer here in Cambridge
Who am I?

- William Tunstall-Pedoe
- Founder of business
- Developed core technology
- Cambridge CompSci (Churchill)
  - Student in first ever 1A CST course
  - Former attender of Enterprise Tuesday lectures...
People instantly able to get any information, on any subject.... just by asking for it
Evi Vision

Big Hairy Audacious Goal:

“Answering any question, in any language, in one second or less”
Six things this requires

1. Knowledge representation:
   - Getting world’s knowledge in computer understandable form
2. Understanding natural language
3. Common sense knowledge
4. Inference
5. Natural language generation
6. *Speech recognition and synthesis*

* Evi’s core technology is 1-5
• Deep technology developed in 1999/2000
• Structured knowledge and inference
• Broad approach is now common:
  • Google Knowledge Graph (2010)
  • Wolfram Alpha (2009)
Evi financing

• 2006: government grant + F&F money (£75k+£45k)
  • 3 people working in St Johns Innovation Centre
    • One year of work and a crude demo
• 2007: Angel round (£650k)
• 2008: First real Venture Capital round (£2m)
  • Octopus Ventures
• Many further financing rounds followed...
What is a Pivot?

• Success in business requires iteration
• A pivot is a significant change in direction
  • But still based on core strength
• With Evi (True Knowledge) the vision stayed exactly the same
  • but needed four different attempts to find success
#1: Stand-alone website (~2006)

- First attempt: stand-alone consumer website
  - www.trueknowledge.com
- Consumers could ask questions and add knowledge
- Web-search would be shown when not answered
True Knowledge is an internet search company. Our unique technology represents general knowledge in a form that computers can understand and process.

We are using it to build a repository of the world's knowledge that can be used to directly answer questions from humans and other computers... (more)

WE'RE HIRING!

We are looking for passionate and talented individuals to join our growing team. Visit our jobs pages to see if True Knowledge is right for you.

+ NEWS

True Knowledge launches private beta
True Knowledge, the internet search company, is seeking interested users to participate in the private beta testing of its consumer website... (more)

True Knowledge raises first round of venture capital from Octopus Ventures
True Knowledge, the internet search company has raised more than $1.2m to fund the development and marketing of its unique technology... (more)

+ BETA TEST WEBSITE

Help us test our technology and request an account.

Email: [field]

Apply

Existing users log in here:

Username: [field]

Password: [field]

Login

We value your privacy. We will not sell or rent your email address to third parties.

Forgotten password?

Please watch our demo video (just 7 mins). It should rapidly give you a good overview of our technology.
No

There were two interpretations of your question, but they both resulted in the same answer. When you said "single", I understood you to mean one of the following:

- single (not married or in a committed relationship with another person)
- not joined by marriage (monogamous) to another person

This conclusion is based on a single fact in the knowledge base:

Madonna has been married to Guy Ritchie since the 22nd of December 2000 (endorse) (contradict)

(I understood your question to mean: Determine whether single (an ambiguous term) is an attribute which applies to Madonna Louise Ciccone, the famous singer of popular music at the current time?)

External web pages (using standard web search):

**Madonna**
Official Madonna site with galleries, news, music, media, and fan club.
http://www.madonna.com/ - 19k

**Unreleased Madonna single slips onto Net | CNET News.com**
Unreleased Madonna single slips onto Net | The pop singer weighs in on the Net music piracy wars after a copy of an unreleased single finds its way onto ...
Here is the answer that I found:

- **10:01:01 PDT on the 21st of October 2007**

I used the following facts to provide this answer:

- the Googleplex has always been in Mountain View (Silicon Valley), California
- Mountain View (Silicon Valley), California has been in Santa Clara County, CA since at least November 2006
- Santa Clara County, CA has been in California since at least November 2006
- California has been in the Pacific Standard Time region since at least 00:00:00 UTC on the 13th of July 2007
- the Pacific Standard Time region is a time zone area
- Pacific Daylight Time has been the time zone for the Pacific Standard Time region between 10:00 UTC on the 11th of March 2007 and 01:00 UTC on the 4th of November 2007
- 7 hours is the time zone differential of Pacific Daylight Time

(I understood your question to mean: What is the current local time at the location of the Googleplex, Google Inc’s headquarters in Mountain View, California?)

Click here for a more detailed explanation of the answer

External web pages (using standard web search):

TIME: Life in the Googleplex Photo Essay
TIME: Life in the Googleplex: Inside Google Headquarters
An employee at the Googleplex has
http://www.time.com/time/coverstory/2006/inside_google/
Here is the answer that I found:

- **the age 118 years, 9 months and 20 days old**

This conclusion is based on a single fact in the knowledge base:

the 31st of March 1889 is the date of creation of the Eiffel Tower (endorse) (contradict)

(I understood your question to mean: Which ages are an attribute which applies to the Eiffel Tower, the tall iron tower in Paris, France at the current time?)

Click here for a more detailed explanation of the answer.

External web pages (using standard web search):

Paris Eiffel Tower News: Paris Photos
Paris Eiffel Tower News helps you to discover Paris with the ... Paris Eiffel Tower News: Paris Eiffel Tower News Home Page Links: ...

Eiffel Tower Gifts and Souvenirs - from Souvenirs of Paris
... 2006). Our collection of Eiffel Tower souvenirs and Eiffel Tower gifts offers everything ... Tower Blue Silk Scarf $48 Eiffel Tower silk scarf Eiffel Tower Orange Silk Scarf $48 See More Eiffel Tower Scarves Paris ...
Amazon.com

Web Images Groups News Froogle Desktop more »
is Madonna single?
Search:  the web  pages from the UK

Results 1 - 10 of about 3,010,000 for is Madonna single?. (0.21 seconds)

Madonna
Official Madonna site with galleries, news, music, media, and fan club.
www.madonna.com/ - 19k - Cached - Similar pages

BBC News | ENTERTAINMENT | Madonna single 'leaked' online
Madonna joins the fight against MP3 internet firm Napster after her new single is made available for downloading months early.
news.bbc.co.uk/1/hi/entertainment/774430.stm - 30k - Cached - Similar pages

Unreleased Madonna single slips onto Net | CNET News.com
Unreleased Madonna single slips onto Net | The pop singer weighs in on the Net music piracy wars after a copy of an unreleased single finds its way onto ...
news.com.com/2100-1023-241341.html - 34k - Cached - Similar pages

Holiday (Madonna song) - Wikipedia, the free encyclopedia
Due to the success of "Holiday" in the clubs, the song became the first single from Madonna's debut album, receiving a commercial 7" single release. ...
en.wikipedia.org/wiki/Holiday_(Madonna_song) - 36k - Cached - Similar pages

Madonna single leaked via Napster | The Register
The single, to be Madonna's next single and the title track of her new album, Music, was due for a September or October release. But the song was apparently ...
www.theregister.co.uk/2000/06/02/madonna_single_leaked_via_napster/ - 30k - Cached - Similar pages
what time is it at Google Headquarters?

TIME: Life in the Googleplex: Photo Essay
www.time.com/time/photoessays/2006/inside_google/ - 14k - Cached - Similar pages

TIME: Life in the Googleplex Photo Essay (1)
TIME Photo Essay: Life in the Googleplex: Inside Google Headquarters. Desktop gizmos and. EROS HOAGLAND / REDUX FOR TIME ...
www.time.com/time/photoessays/2006/inside_google/1.html - 20k - Cached - Similar pages
[ More results from www.time.com ]

Google Corporate Information: Culture
Google’s world headquarters building is located in Mountain View, California, ... real time searches rising from the surface of the globe toward space, ...
www.google.com/corporate/culture.html - 12k - Cached - Similar pages

Benefits
Parental leave and take-out benefit also apply. See Time Away. ... At Google headquarters in Mountain View, there’s on-site oil change, car wash, ...
www.google.com/support/jobs/bin/static.py?page=benefits.html - 19k - Cached - Similar pages

Wired 11.05: Inside the Soul of the Web
The display sits on a shelf on the second floor of Google’s headquarters, ... On the bottom, the Google offices 12 visible in the photograph.
Eiffel Tower in Paris France. When was the Eiffel Tower built...
Evoking the construction of the Eiffel Tower, operation of the old hydraulic elevator that ran to the top until 1983 and the current elevator...
www.group-trotter.net/france/places/eiffel/eiffel.html - 21k - Cached - Similar pages

Eiffel Tower
The old 200-franc banknote (the equivalent of slightly less than $US 40 at one time) has several pictures of the Eiffel Tower on it, as well as a picture of...
www.atkielski.com/main/EiffelTowerFAQ.html - 50k - Cached - Similar pages

Travel Trivia
It’s probably one of the most recognizable structures in the world. And we’ve uncovered some interesting facts. How old is the Eiffel Tower? 55 years old...
www.offbeattravel.com/trivia.html - 13k - Cached - Similar pages

Metropole Paris The Eiffel Tower
The 106-year-old Eiffel Tower Is In Fine Shape. Paris:- Wednesday, 18 June 1997:- Without doubt, the best place to start a trip to the top of the Tour...
www.metropoleparis.com/1997/06/23225/eiffel.html - 31k - Cached - Similar pages

The latest news
Spreading holiday cheer to young and old alike, the Eiffel Tower offers a decorative visit of the monument during this holiday season. ...
Please tell me about the source of the fact that Alan Wallace is a founder of Katalyst Ventures.

Are you the source for this fact?
○ Yes
○ No

If you are not the source, please enter the source of the fact here:

katalyst

If you know the fact because somebody else with direct experience told it to you, enter the name of that person.

If you got the fact from a website, enter the name of the site or the web address of the page where you saw the fact.

Or, for example, if you know it because you read it in a newspaper, or saw it on the television, enter the name of the newspaper or TV programme.

You can also enter additional information about how you know the fact here, to help other users understand where the fact came from. For example, if you have cited a newspaper as a source you can give the date and page number here.

Entering this information is optional. (Maximum 500 characters.)

This is mentioned on the company website. The company gave his name in an email listing the founders and he has also told me this himself.
True Knowledge Launches Natural Language Search Engine

Michael Arrington

Cambridge, UK-based True Knowledge released its natural language search engine into private beta yesterday (a story broken by TechCrunchUK).

Like the much-anticipated Powerset, the company aims to give appropriate answers to natural language queries, even if key query terms are not included in the data being indexed. Current search engines are unable to return appropriate results for these queries.

At first glance True Knowledge and Powerset are competitors - but in fact they really aren't. Powerset is both indexing the web and working to convert natural language queries into database-understandable queries. True Knowledge is only tackling half the problem - the conversion of queries. They are not indexing the web.

Instead, True Knowledge is grabbing data from structured databases, like, for example, the CIA Factbook. In many ways, they are more comparable with Freebase, a startup focused on gathering
Result of first attempt

- Competing directly with Google
- Great technology demo
  - but no significant consumer traction
- Company lacked product and UX expertise
Just as people don’t tell proud parents when they have an ugly baby...
...founders rarely get feedback about things they are doing badly.

Our website was very weak from a design point-of-view.
...a lesson we didn’t learn until 2011
#2: Platform for ‘Big Search’ (~2008)

- Second attempt (first pivot):
  - License technology to “Big Search”
    - (Google, Bing, Yahoo, Yandex, Baidu....)
  - Box at the top of search results
    - when direct answer possible
True Knowledge API lies at the heart of real business model

**Summary:** Semantically powered question answering start-up True Knowledge today made its Semantic Search API available for public consumption, taking the next step on the company's journey out of beta and providing a clear steer as to the way in which they intend to generate revenue. As the company's press release notes, "True Knowledge offers two distinct API services for developers: the 'Direct Answer API' and the 'Query API.'"
Result of attempt #2

- Solid engagement but no deal
- Not-invented-here
- Latency

- Some smaller (non Big Search) deals done though
API used in other products

According to TrueKnowledge.com: 2,783 Kilometers (1,729.28 miles)

According to TrueKnowledge.com: 47 years, 11 months and 19 days old
#3: SEO (June 2009-2010)

- Third attempt: get content into search by having it indexed
- SEO = Search Engine Optimisation
  - getting Google to send you free traffic
- No need to do deal with search engine
- Inferior user experience to direct integration
  - but much easier to achieve
SEO for trueknowledge.com

• trueknowledge.com/q/this_is_a_question
  • calls platform for “this is a question?”
  • Infinite questions -> Infinite pages

• Point Google at (millions of) valuable questions
  • Google indexes and sends customers to you

• (plus lots of black art)
population of Iran 2010 - True Knowledge

population of Iran in 2010 - True Knowledge
What's the population of the Islamic Republic of Iran in 2010? ... www.trueknowledge.com/q/population_of_iran_in_2010 - Cached - Similar

What is the population of Iran in 2010? - True Knowledge
Iranian Population Inside and Outside Iran 2010 - Topix. Jul 25, 2010 ... www.trueknowledge.com/q/what_is_the_population_of_iran_in_2010 - Cached

Iran - CIA - The World Factbook
9 Nov 2010 ... total population: 1.02 male(s)/female (2010 est.) Infant mortality rate: ... conventional long form: Islamic Republic of Iran ... https://www.cia.gov/library/publications/the-world.../ir.html - Cached - Similar
Results

• Exponential growth for a long while
  • 10%+ per week
• Strange effects
“is Michael Jackson dead?”
2,405,491 people visited this site
3.8m September 2010 4.4m October. 5.2m November.
19 consecutive record weeks only broken by Thanksgiving

12,999,167 people visited this site
What we were able to say about size (Jan 2011)

Growth in traffic

Global Web Traffic: Alexa Rank

- BBC: 47
- LOVEFiLM: 4065
- Vodafone: 4353
- TrueKnowledge: 4403
- Sainsbury's: 4683
- Zoopla: 5789
Fun things we did

• ‘Exponential’ purchasing of crates of beer...
• Buy ever growing increases when traffic grew >10% in a single week (to new record)
  • 1 crate, then 2 crates, then 3 crates etc.

• To be drunk at 2010 Christmas Party
Result

• Team highly focussed on growth

• So much beer at party it would have killed team if all drunk...
• Team highly focussed on growth

• So much beer at party it would have killed team if all drunk...

• Still drinking it nine months later...
Second fun thing...

• SEO benefits from links to site
• PR about company is therefore helpful

• Used our technology to calculate the most boring day in history: April 11\textsuperscript{th} 1954
  • and put out Press Release
Result

• Thousands and thousands of press mentions
  • in hundreds of languages
Here isn’t the news

April 11, 1954... the most boring day of the 20th century

By Andrew Levy

IT WAS the year that Roger Bannister broke the four-minute mile and food rationing came to an end.
The Queen became the first reigning monarch to visit Australia and Marilyn Monroe married Joe DiMaggio.
But amid historic events of 1954 was a date which can only today be classed as significant—for its insignificance.
April 11 of that year has been identified by experts as the most boring of the 20th century—a day when nothing of note happened.

After feeding 300 million facts into a new computer search engine they have announced there were no key news events or births and deaths of famous people.
The best the machine could muster for the day was the fact that Belgium had its fourth post-war general election and a Turkish academic who taught electronics was born.

Journeyman footballer Jack Shuflebotham, who played a handful of games for Oldham Athletic and Notts County, died, aged 66, and plans for a coup d’etat in Yangon, a French colony in India, are believed to have been agreed.

But it could all have been so different for April 11. History notes that Bill Haley and the Comets recorded Rock Around the Clock the next day.

It was not the first time a particular day has been singled out for its lack of moment.

According to BBC Radio, April 11, 1930, was the dulllest day of the 20th century after an announcer informed the nation at the 6.30pm bulletin: ‘There is no news.’

But the experts claim this date fell in the midst of the Great Depression and witnessed the death of Joaquin Arcoverde de Albuquerque Cavalcanti, the first Cardinal to be born in Latin America.

There was also the birth of Clive Revill, the New Zealand-born actor best known for his Shakespearean performances on the London stage.

William Tunstall-Pedoe, founder of the new search engine True Knowledge, which is based in Cambridge, said: ‘When the results came back, the winner was April 11, 1954—a Sunday.

‘Nobody significant died that day, no major events apparently occurred and, although a typical day in the 20th century has many notable people being born, for some reason that day had only one who might make that claim—Abdullah Atalar, a Turkish academic.

‘The irony is, though, that having done the calculation—the day is interesting for being exceptionally boring.

‘Unless, that is, you are Abdullah Atalar.’

True Knowledge, which provides a direct answer to a question instead of providing a list of links like other sites such as Google, was launched online in February this year.

The system can store hundreds of millions of facts about people, places, events and businesses.

a.levy@dailymail.co.uk

Amazon.com
The most boring day ever? 1954

Friday, November 26, 2010

As scientists in the UK's Channel 4 News asks can it be true?

11 April 1954

All the days in the year are described as being

"Experts", we're told, have pinpointed the 20th Century's most boring day — April 11, 1954.

The day with no news... except a Belgian poll and death of, er, Jack Shuffebotheram.

THE DAY NOTHING HAPPENED

... well... nothing great happened on 4-11-54.
NEIL BOOZE RANT ON JET FROM OZ

Celeb behaving badly

Brand is driven to pass test

DRUNKEN Neil Morrissey shocked Club Class passengers with a series of foul-mouthed rants as he jetted back fromcommenting on I'm A Celebrity.

The champagne-swigging star of Man Behaving Badly, 51, was so bloody that crew were ready to handcuff him before he finally fell asleep.

A passenger who was on board the flight from Sydney to Frankfurt said: "Neil finally fell asleep after ranting at the cabin crew and air hostess. He then refused to co-operate with the cabin crew when he boarded flights back to Heathrow."

At one stage, the passenger said, "I'm an ex-convict and I'm in no mood to put up with anyone's shit."

A representative for Morrissey's management company said: "Neil may have been a bit irritable on the flight back from Sydney."

EXCLUSIVE BY JAMIE PYATT

Star role for Ross on Beeb

FORMER 'coronation Street' star Liam Fox, 26, is set to bag a new role in the BBC soap filming in Manchester.

"I was asked to go for an interview to play a young character," said the 26-year-old. "I don't know if they're going to have me in permanently, but it's great to be approached by the BBC."

FORMER 'harry Potter' star Jessie Williams, 23, is set to take on a role in the film The Young and the Restless.

The film, which is due to be released next year, will see Williams play the role of a young woman who becomes embroiled in a love triangle with two other characters played by Colin Farrell and Jude Law.

FREE CORRIE DVD TOMORROW

THE RAJAS escape from a hotel in the Indian town of Jaipur and head for the Indian city of Mumbai.
NEWS IN BRIEFS

DANNI is intrigued that scientists have identified the most boring day of the 20th Century. She said: “I tend to agree with the words of philosopher Bertrand Russell who said, ‘Boredom is a vital problem for the moralist, since at least half the sins of mankind are caused by the fear of it’.”

ALISON WEBSTER
Boring day...

• We were nominated for PR Industry award

• Have had more press (spontaneously) every April 11\textsuperscript{th} since...
Still there several years later...

Google search from 8th February 2015
How did the SEO pivot work out?

• Failed financing
  • despite hockey-stick graph, Silicon Valley not interested in SEO anymore

• Google ‘Panda’: 50% loss of traffic in Feb 2011
  • never made it to cash-flow positive

• What now?
#4: Evi (2011-2012)

- Fourth attempt: own branded mobile product
  - Powered by our core tech
  - UX and mobile product skills needed quickly
- Major pivot – we bet the company
  - Team changes/funding milestone
Evi timeline

• Committed to pivot early 2011
• Funding milestone and first version June 2011
  • company ‘lockdown’
• Apple launched Siri October 2011
• Evi launched January 2012
Who are you

Today 09:55

I'm Evi, your thinking, talking, computerised assistant.

Who made you

Today 09:56

My creators are the company Evi (formerly known as True Knowledge), a semantic technology company based in Cambridge, UK.

What is the capital of France

Today 09:56

France's capital city is Paris.
What is the capital of France

Today 09:56

France’s capital city is Paris.

What day was 8 June 1981

Today 09:56

the 8th of June 1981 was a Monday.

Amazon.com
How old is Cambridge University

*Cambridge University* is 805 or 806 years old. Its foundation happened in 1209.

Where can I get Chinese food near here

*Jinling Noodle Bar, Hong Kong Fusion, yummi chinese, The Hotpot and Hakka* are the places to buy Chinese food near your current location.

Amazon.com
the 8th of June 1981 was a Monday.

Who founded Amazon

Amazon.com's founder is Jeff Bezos.

Jeff Bezos

Albuquerque, New Mexico

How old is he

Jeff Bezos was born on the 12th of January 1964. That makes his current age 49 years, 9 months and 2 days old.
I found 11 results.

Paradigms of Artificial Intelligence
Peter Norvig

Artificial Intelligence: A Mod...n
Stuart J. Russell

Game of Shadows
Lance Williams

Python Cookbook
David Ascher

Why are there so few female...
Ellen Spertus

The Practice of Programming
Brian Kernighan

Sky Blue, the 5th studio album by American Jazz Composer, Maria Schneider.

Why is the sky blue
The sky is blue because of a phenomenon called Rayleigh scattering. The molecules of the atmosphere and dust in it scatter blue light more than red or yellow light, so when you look away from the sun more blue is knocked off course into your eye than red. The sun looks yellow for the same reason.
Will it rain tomorrow

Yesterday 12:17

Yes. Seems a bit damp, but not properly wet. Tomorrow in Pike Place Market there will be black clouds with a temperature of 12°C (53°F). Later in the day it will rain.

Data supplied by the Met Office

<table>
<thead>
<tr>
<th>Time</th>
<th>Weather</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2am</td>
<td>black clouds</td>
<td>9°C (48°F)</td>
</tr>
<tr>
<td>5am</td>
<td>black clouds</td>
<td>9°C (48°F)</td>
</tr>
<tr>
<td>8am</td>
<td>black clouds</td>
<td>9°C (48°F)</td>
</tr>
<tr>
<td>11am</td>
<td>light rain</td>
<td>10°C (50°F)</td>
</tr>
<tr>
<td>2pm</td>
<td>black clouds</td>
<td>12°C (53°F)</td>
</tr>
</tbody>
</table>

Amazon.com
Result of fourth attempt

- Success!
- Enormous interest:
Apple's Siri has a new British rival - Evi

Cambridge firm True Knowledge outsmarts tech giant with phone app that copes with variety of UK accents
• Success!
• Enormous interest:
  • >1 million downloads
  • 40 serious approaches from big companies
• New CEO
• Company name change (True Knowledge -> Evi)
• Acquisition by Amazon
  • completed October 2012
The adventure continues...
Amazon’s new Cambridge development centre (Castle Park)
Amazon Echo launch

• Amazon doing amazing things in speech and language space

• Echo launched in November 2014
  • the project I work for
Amazon just surprised everyone with a crazy speaker that talks to you

It's called Echo, and it's shipping 'in the coming weeks'

By Chris Welch on November 11, 2014 11:56 am - Email @chriswelch

Introducing Amazon Echo

amazon echo
amazon.com/echo

Well this one came out of nowhere: Amazon is building a speaker that's controlled with
Other teams hiring in Cambridge

• Prime Air (www.amazon.com/primeair)
Final thoughts

• Very big ambitions can carry you a long way

• A great idea often needs multiple iterations to hit success
Questions?

• William Tunstall-Pedoe
  • wpedoe@amazon.com

• http://amazon.jobs/location/cambridge-uk