

Charlie

EFSA Hackathon

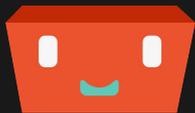
Parma, 24 September 2016

Giuseppe Sollazzo, Lewis Westbury & Kevin Lewis

@puntofisso

@instantiator

@_phzn



The team

Lewis Westbury



Mobile developer for
iOS/Android

Innovation @ Met Police

Former Google Maps dev

Giuseppe Sollazzo



High Performance Computing
& Systems Lead

Open Data Ministerial Advisor

Data & Innovation Consultant

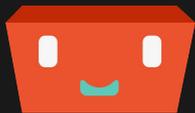
Kevin Lewis



Freelance Technical Events
Coordinator for Government

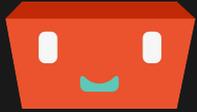
Front End web Developer

User Experience Designer



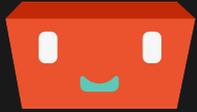
The team's experience





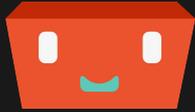
The challenges for this project

- A. Hugely technical dataset only understood by the sector
- B. Make it easy to access and query
- C. Use widely available platforms



The big question

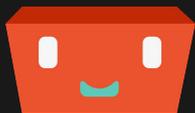
**How can we get the public
closer to complex datasets?**



This is what users want to know

“What was Monsanto up to in 2008?”

“Which companies are interested in maize?”



Chatbots and NLP are the future



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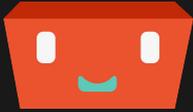
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Chat Bots Aren't a Fad. They're a Revolution.

If you thought chat bots might quietly disappear, think again. They're evolving fast, and only getting chattier.





Chatbots and NLP are the future

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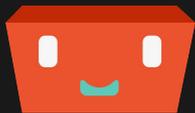
April 13, 2016 1:49 pm

Facebook bot platform to transform entire industries

Hannah Kuchler in San Francisco

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Social network wants companies to develop AI-powered systems on its Messenger platform



Chatbots and NLP are the future



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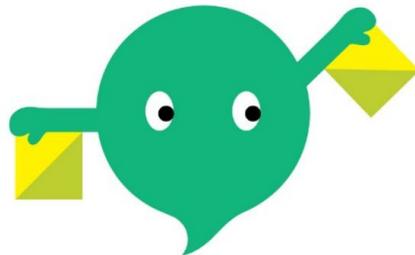
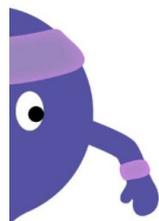
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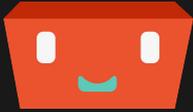
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2 days ago · 14 min read



Chatbots: Your Ultimate Prototyping Tool

How chatbots can teach us to learn what people need when designing products



Chatbots and NLP are the future

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Chatbot lawyer overturns 160,000 parking tickets in London and New York

Free service DoNotPay helps appeal over \$4m in parking fines in just 21 months, but is just the tip of the legal AI iceberg for its 19-year-old creator





We built Charlie

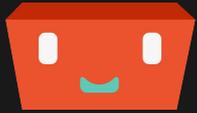
Charlie is a chatbot

Using AI techniques

It detects a user's intention

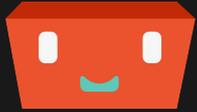
And queries the database accordingly

Charlie is a multiplatform mobile app powered by an API



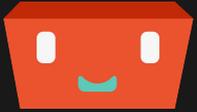
User needs

- As a **journalist** I want to find out what Monsanto are up to, so I can report my findings in an article with sources.



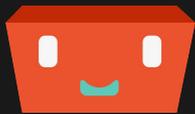
User needs

- As a **journalist** I want to find out what Monsanto are up to, so I can report my findings in an article with sources.
- As an **health conscious person** I want to know what companies are very interested in certain pesticides, so I can make more informed choices.



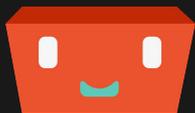
User needs

- As a **journalist** I want to find out what Monsanto are up to, so I can report my findings in an article with sources.
- As an **health conscious person** I want to know what companies are very interested in certain pesticides, so I can make more informed choices.
- As a **Food Scientist** I want to research distribution of variance of searches in certain chemicals over time, so I can find areas of interest to research further.

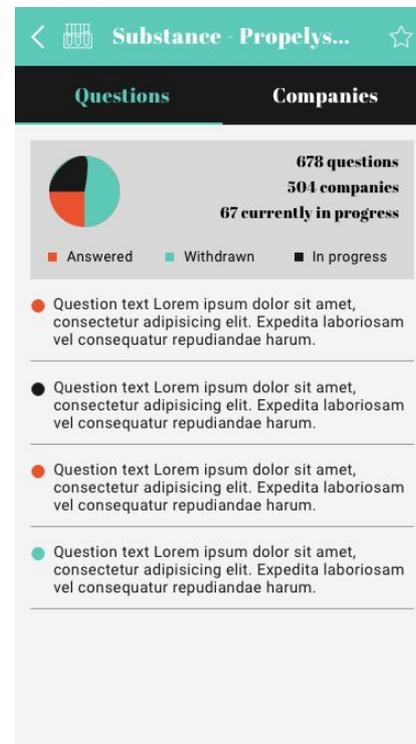
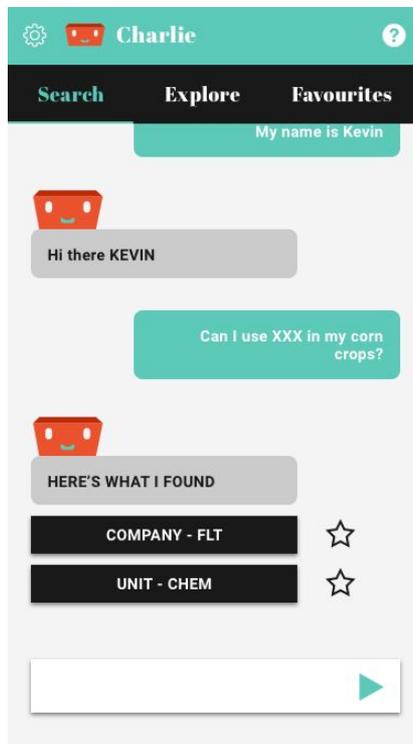
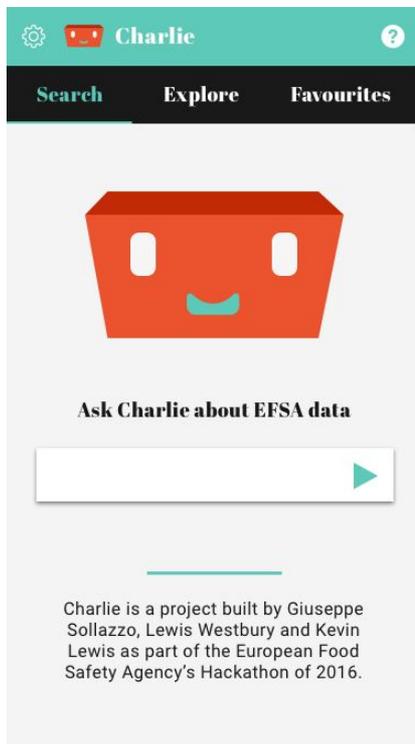


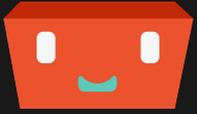
Design considerations

- Had to be accessible for everyone, from scientists, to non-technical citizens.
 - ◆ Needs to run on common platforms/devices held by everyone.
 - ◆ Has to be easy to use (feels similar to other apps on the platform).
- Easy, quick and clear to get started.
- Easier to navigate than the large dataset online.
 - ◆ Well structured and clear UI.

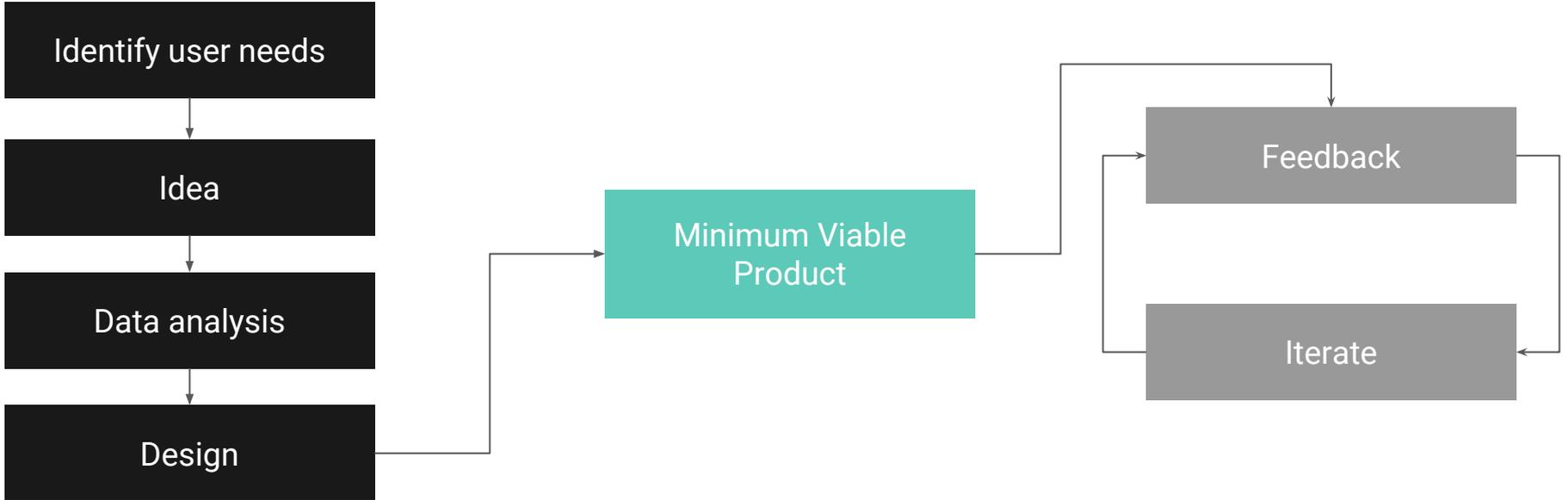


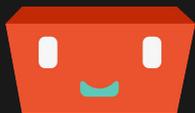
High Fidelity Mockups





Process





Intro to LUIS

LUIS [Back to Production](#) [My Applications](#) [About](#) [Help Docs](#) [Support](#) [Giuseppe Sollazzo](#) [Sign Out](#)

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Intents (+)

- LOOKUP_HANDLER
- None
- LOOKUP_SUBSTANCE
- LOOKUP_COMPANY
- LOOKUP_QUESTION

Entities (+)

- handler
- company
- list_type
- substance

Pre-built Entities (+)

- datetime

Can you show me questions between august 2008 and august 2016 about maize →

can you show me questions between august 2008 and august 2016 about maize dealt with by the gmo panel ?

LOOKUP_QUESTION(0)

Submit

Performance analysis

Intents

None
82 utterances: 78 correctly predicted

LOOKUP_SUBSTANCE
92 utterances: 90 correctly predicted

LOOKUP_COMPANY
97 utterances: 73 correctly predicted

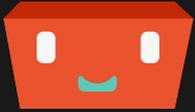
LOOKUP_HANDLER
104 utterances: 104 correctly predicted

LOOKUP_QUESTION
441 utterances: 436 correctly predicted

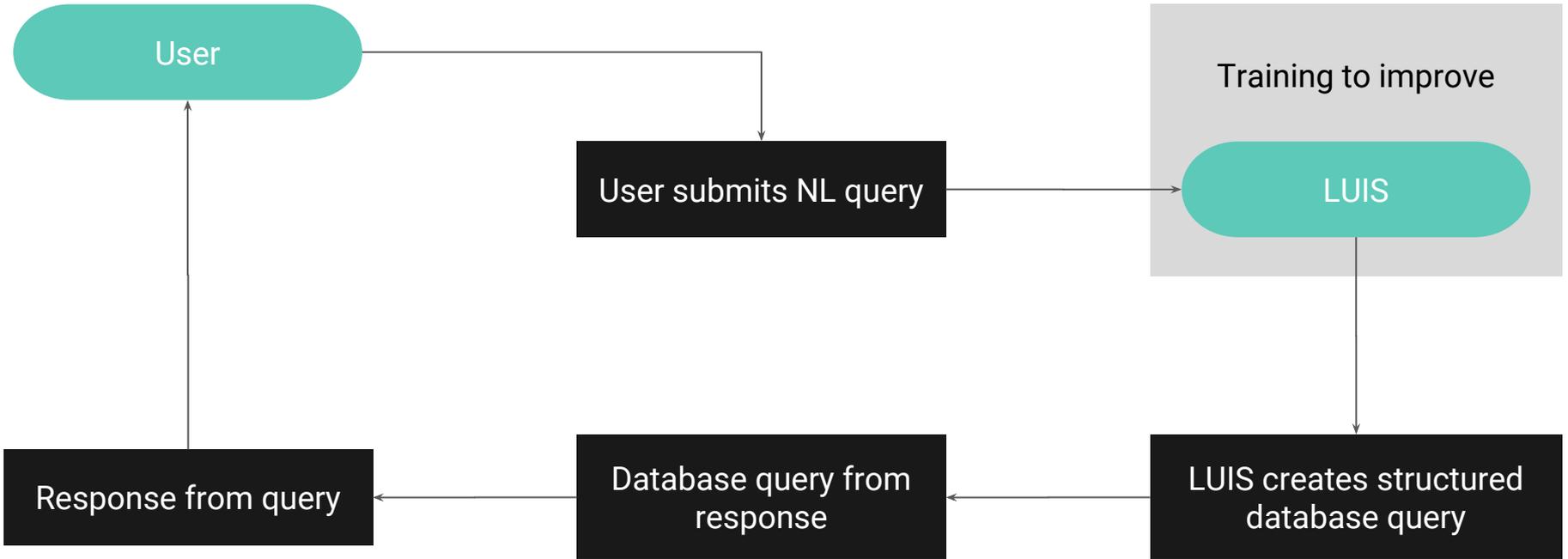
Correctly predicted
Error (predicted as other intent)

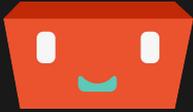
[Train](#) Last train completed: 9/23/2016, 5:38:20 PM

Microsoft



Intro to LUIS



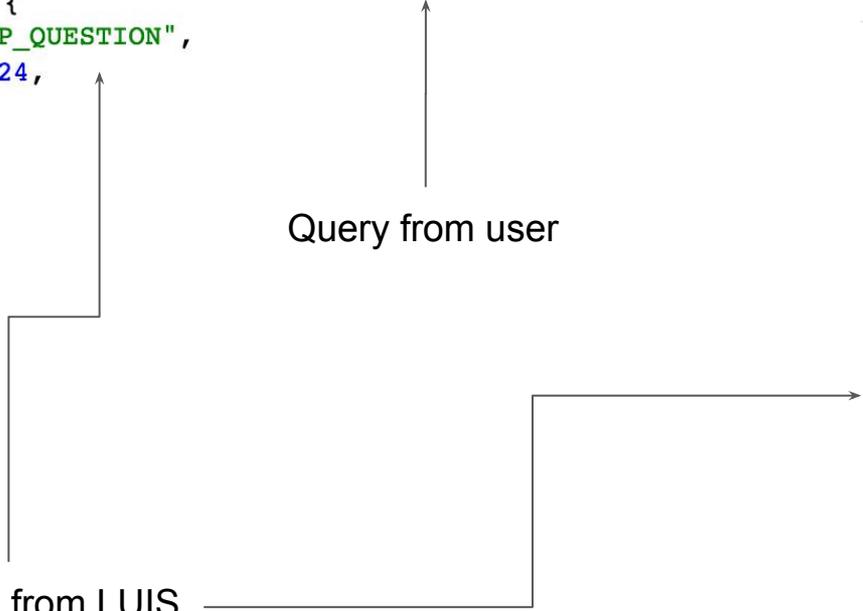


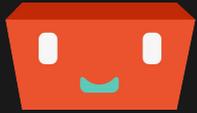
Intro to LUIS - Response

```
{  
  query: "Can you show me questions between august 2008 and august 2016 about maize dealt with by the gmo panel?",  
  - topScoringIntent: {  
    intent: "LOOKUP_QUESTION",  
    score: 0.6733524,  
  },  
  - entities: [  
    - {  
      entity: "between august 2008 and august 2016",  
      type: "builtin.datetime.date",  
      startIndex: 26,  
      endIndex: 60,  
      - resolution: {  
        date: "2008-08"  
      }  
    },  
    - {  
      entity: "between august 2008 and august 2016",  
      type: "builtin.datetime.date",  
      startIndex: 26,  
      endIndex: 60,  
      - resolution: {  
        date: "2016-08"  
      }  
    },  
    - {  
      entity: "maize",  
      type: "substance",  
      startIndex: 68,  
      endIndex: 72,  
      score: 0.9893429,  
      resolution: { }  
    },  
    - {  
      entity: "gmo",  
      type: "handler",  
      startIndex: 92,  
      endIndex: 94,  
      score: 0.982269168,  
      resolution: { }  
    }  
  ],  
}
```

Query from user

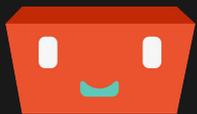
Response from LUIS



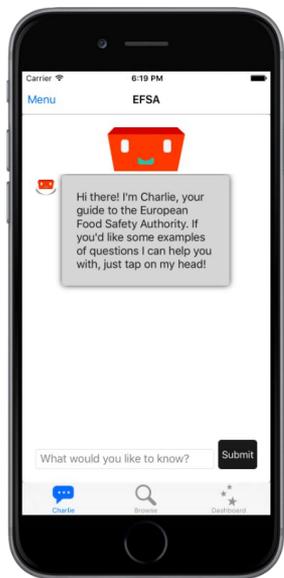


Demo

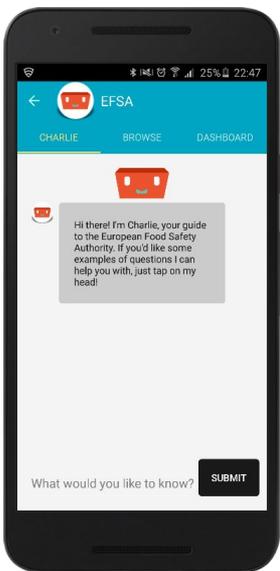
Demo time



Technologies



iOS



Android

Xamarin.Forms



- Work in C#
- Fast prototyping
- Build native apps
- Build-once, run-anywhere
- Excellent data manipulation
- Focus on the logic



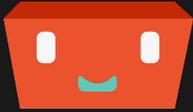
Laravel

LUIS



- Work in PHP
- Derived from Symphony
- Fast prototyping
- Build APIs for any dataset
- Easy routing
- Simple to set up
- Focus on the logic

TLS



REST API

Chat

```
/chat/unity/{convoid}/{text}
/chat/luis/{previeworproduction}/{text}
/chat/luis/parse/{previeworproduction}/{text}
/chat/aiml/{convo_id}/{text}
```

Data lookup

```
/LOOKUP/HANDLER/{company}/{substance}/{datefrom}/{dateto}
/LOOKUP/COMPANY/{handler}/{substance}/{datefrom}/{dateto}
/LOOKUP/SUBSTANCE/{handler}/{company}/{datefrom}/{dateto}
/LOOKUP/QUESTION/{company}/{handler}/{substance}/{datefrom}/{dateto}
```

User log management

```
/logs
/logs/delete
```

Favourite management

```
/favourite/add/{type}/{id}
/favourite/remove/{type}/{id}
/favourite/check/{type}/{id}
/favourite/list/light
/favourite/list/full
```

Data update

```
/admin/question/get/{id}
/admin/question/update/{id}/{field}/{value}
```

Data query helpers

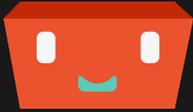
```
/mandates/get/{id}
/mandates/list

/questions/get/{id}
/questions/get/{id}/status
/questions/get/{id}/tags
/questions/get/{id}/lastupdate
/questions/tags/search/{tags}

/tags/get/{tag}

/unitpanel/all
/unitpanel/units
/unitpanel/panels
/unitpanel/get/{name}

/petitioners/list
/petitioners/get/{name}
/petitioners/timeline/{name}
/companies/tags/search/{tags}
```



Iterating - the importance of logging

Can you let me know which substances were the subject of questions by Exponent International Ltd.?

Can you list all questions asked by basf in 2004?

Can you show me questions between september 2004 and december 2009 asked by columbus paradigm inst. s. A. dealt with by assessment and methodological support

Can you show me substances researched between June 2013 and March 2014?

Gliphosate

Caffeine

Potassium

List all the questions about gmo

Opinions on aspartame?

Tell me everything about glyphosate

Vehicular are the opinions on glyphosate

What do you know about caffeine?

What do you know about glyphosate ?

Which are the opinions about caffeine?

Which companies asked questions about cow from 1986 to 1998?

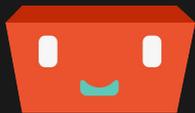
Which companies asked questions about cow from 1986 to 2016

Which company asked questions to panel AFC?

Which questions have been received in 2015

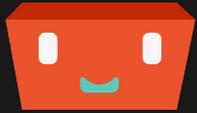
Which substances have been asked by Monsanto in 2014?

Who dealt with questions about triglycerides asked by du pont denemours germany?



Future scope & plans

- Incorporate favourites mechanism as designed
- Improve accuracy and range of questions
- Explore alternative AI models
 - Api.ai
 - Clarifai
 - AIML
 - IBM Watson Conversation
- Image recognition
- Open Products datasets



In summary

The aim: get the public closer to complex datasets

Charlie is a multiplatform mobile app powered by an API

LUIS converts natural language to a structured query

Built with Xamarin.Forms and Laravel

Easily extensible and customisable

