



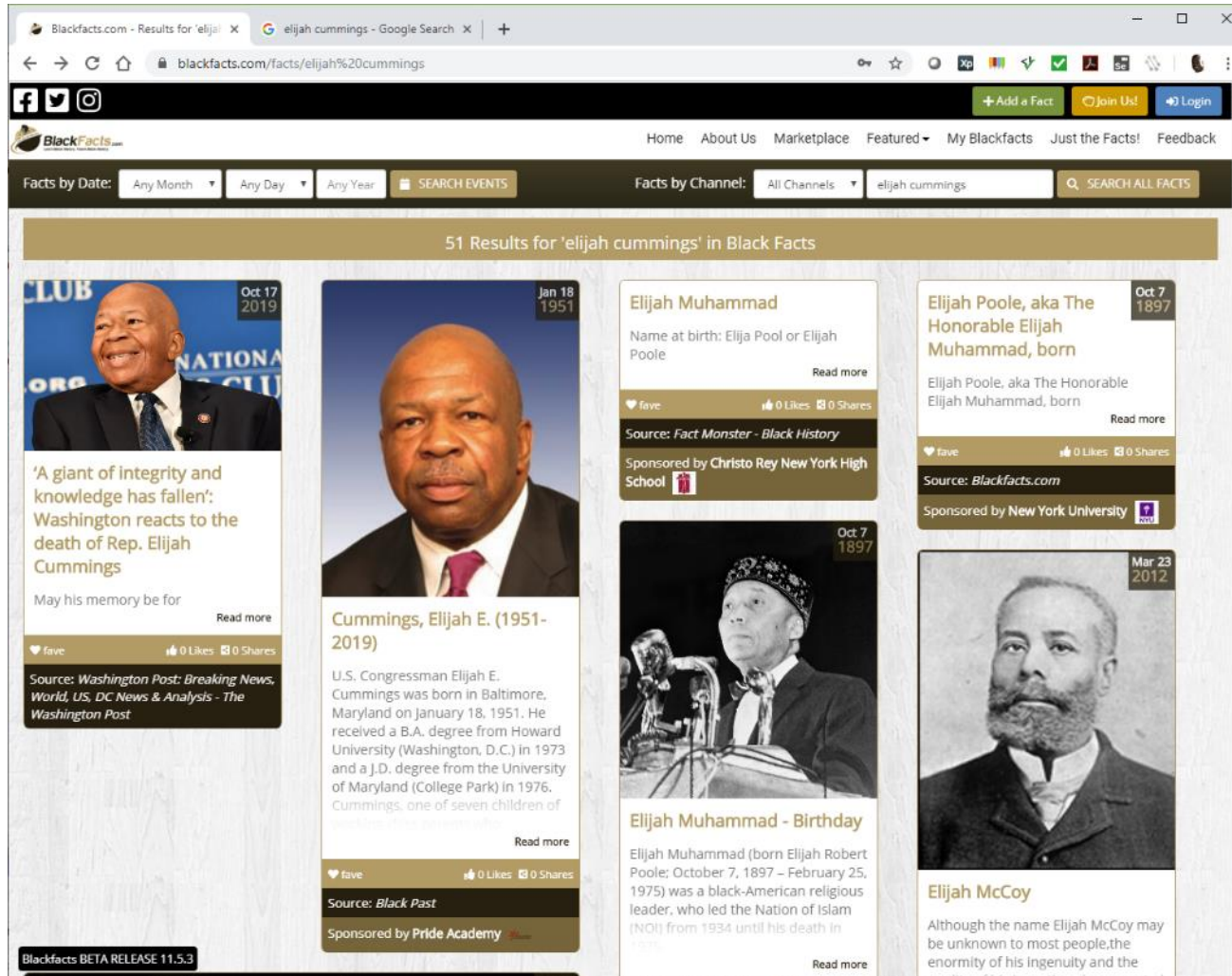
BlackFacts.com

Learn Black History. Teach Black History

AI Analysis Challenges

Improving the Results from AI Technologies in Blackfacts

TL;DR Verison (Detailed Versions in Subsequent Slides)



- Launched in 1997, Blackfacts.com is the Internet's Black History Encyclopedia
- We link Articles by running Entity Analysis from 2 AI systems (Aylien and Watson) to find common People / Places / Concepts / Keywords / etc
- The Relevance numbers returned by the AI Engines are useless as they do not understand the context of the content, so Human Intervention is Required
- As the AI engines generally return more 'Noise' than 'Signal,' manual selection of the 'Good Stuff' is labor-intensive
- This reduces the potential for crowd-sourcing content, as very few will do the work necessary to identify relevant linkages.
- So we are looking for approaches used in the world of AI / Data Science / etc to enable more automation of the Entity Analysis results



Fact Linkage

The screenshot shows the Blackfacts website interface. At the top, there's a navigation bar with links like Home, About Us, Marketplace, Featured, My Blackfacts, Just the Facts!, and Feedback. Below this is a search bar with filters for 'Facts by Date' (Any Month, Any Day, Any Year) and 'Facts by Channel' (All Channels, elijah cummings). The main content area displays '51 Results for 'elijah cummings' in Black Facts'. Several fact cards are visible, each featuring a photo, a date, and a brief description. For example, one card for Elijah Cummings (Oct 17 2019) mentions 'A giant of integrity and knowledge has fallen: Washington reacts to the death of Rep. Elijah Cummings'. Another card for Elijah Muhammad (Oct 7 1897) mentions 'Elijah Muhammad (born Elijah Robert Poole; October 7, 1897 – February 25, 1975) was a black-American religious leader, who led the Nation of Islam (NOI) from 1934 until his death in 1975'. A third card for Elijah McCoy (Mar 23 2012) mentions 'Although the name Elijah McCoy may be unknown to most people, the enormity of his ingenuity and the...'. Each card has a 'Read more' link and social media sharing options.

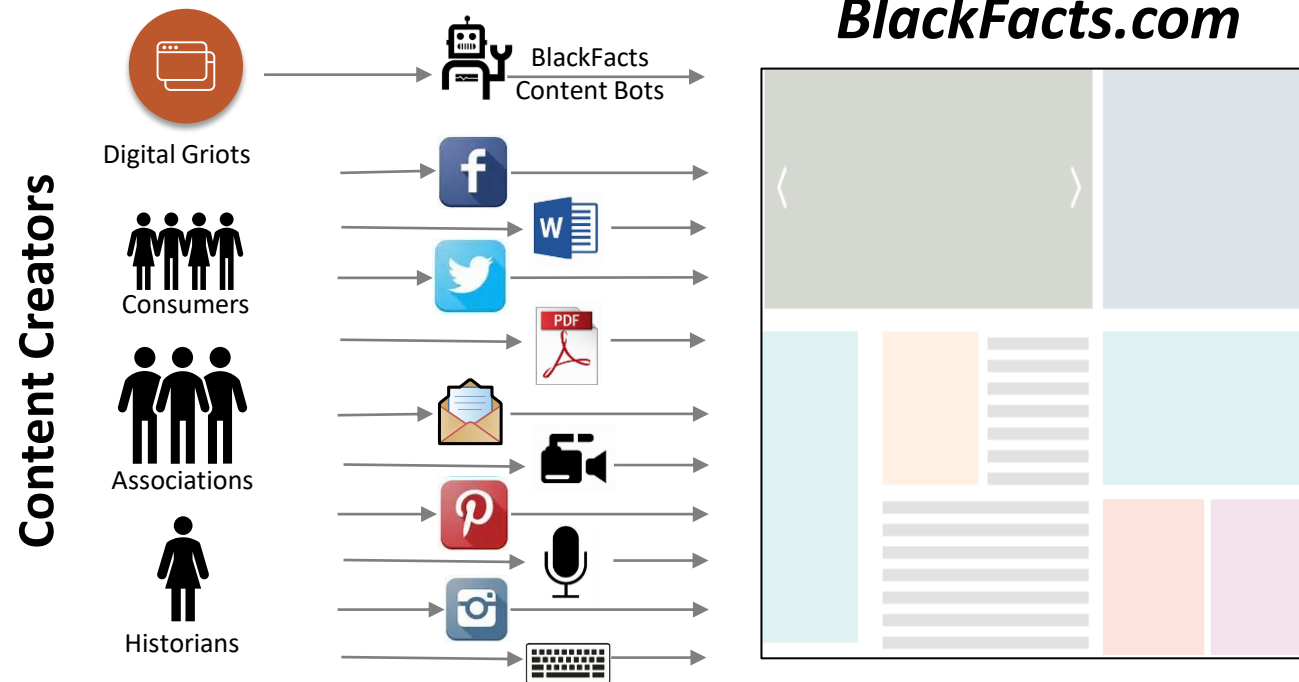
A core feature of Blackfacts is the linkage between 'Fact Cards' based on various types of searches.

This linkage is based on common factors between facts, and is the foundation of Blackfacts' efficacy as an educational tool, as it mirrors the human mind's process of associating pieces of information with each other.

This linkage can be based on both human and machine knowledge, but Blackfacts' future as The Black Wikipedia / Encyclopedia Africana relies on evolving the machine learning functionality to a level where it will be able to categorize and link millions of facts accurately with minimal human intervention required.



Fact Sources



Black Facts content can come from a variety of sources, including:

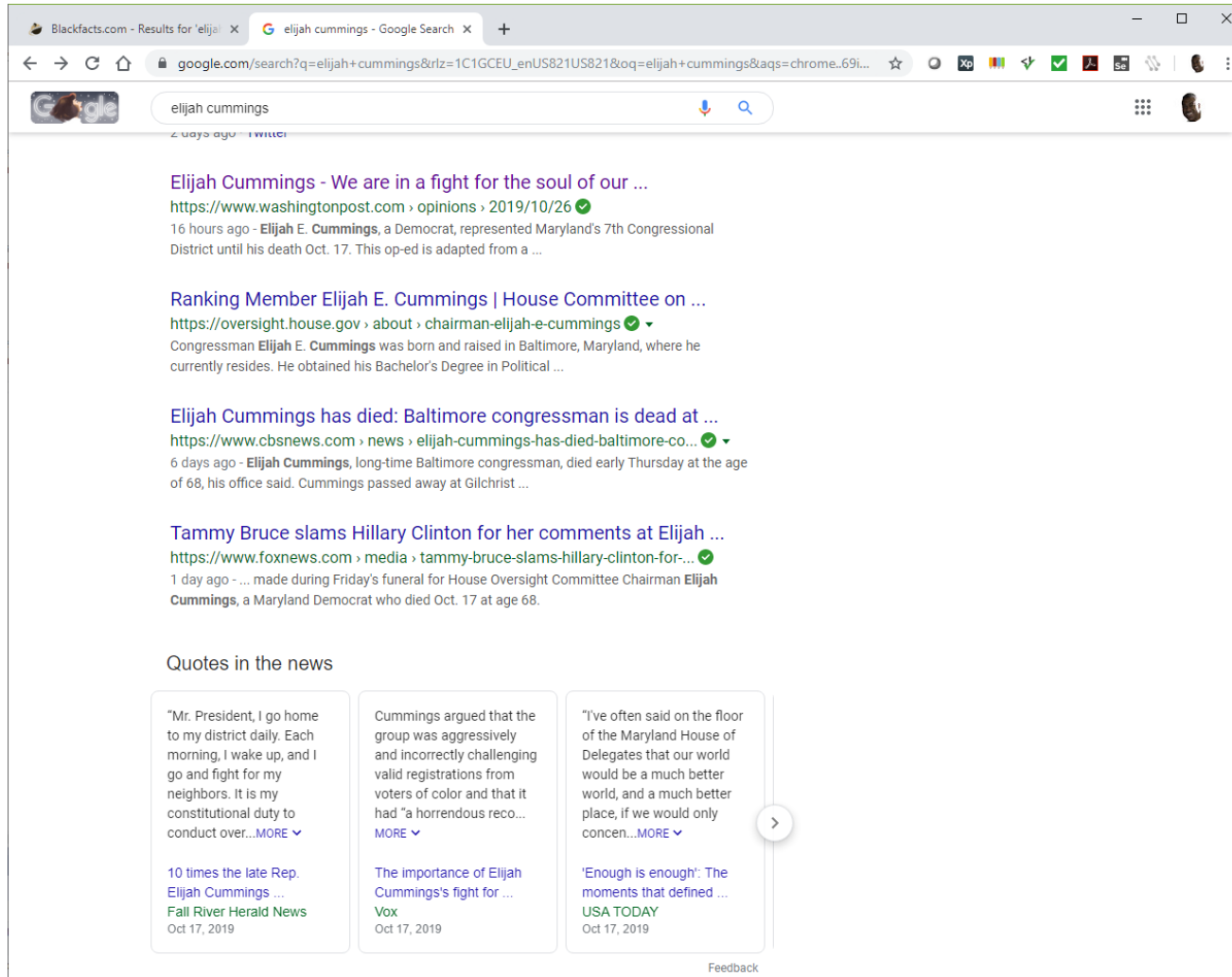
- Existing Historical Site Urls
- Online News Sites
- Member Uploaded Files
- Member Social Media Posts (future)
- Member Emails (future)
- Member Recorded Media (future)

Regardless of the source, the text of the content is extracted as the 'lowest common denominator' required by the AI systems currently in use (image recognition etc is in the future) and analyzed by the AI systems to identify people, places, organizations, concepts, etc that can be used to link the Facts.

Fact submitters can also add additional people, places, etc into Blackfacts to augment the frequent lack of the AI systems recognizing them, as well as the AI systems linkages being limited to the submitted text (i.e. the text not mentioning well-known organization affiliations).



Add A Fact (Crowdsourcing Black History)



Currently, the most common Fact sources are online articles about historical or current people, events and organizations.

The image shows a Google search initiated outside of Blackfacts.com. Currently under development are in-site search tools as well as a browser extension that would enable submitting a Fact from any web page currently being viewed.



Add A Fact - Create

Blackfacts - Add Facts

blackfacts.com/add

Home About Us Marketplace Dashboard Featured My Blackfacts Just the Facts! Feedback

Facts by Date: Any Month Any Day Any Year SEARCH EVENTS

Facts by Channel: All Channels Type Search SEARCH ALL FACTS

Blackfacts.com - Black Fact Submission Page

ADD / EDIT BLACK FACTS: Logged in as Ken Granderson

Fact: -- Add New Fact --

Step 1 - Create Your Fact Step 2 - Add Pictures Step 3 - Categorize Step 4 - Submit Fact Done!

Paste a Url, copy Word / PDF file or Type your Fact

Fact Type: Article Biography Business Event Meta Organization Place School Speech Video

Url: Paste Fact Url

Title: Fact Title

Article Text: Fact Text

Smry: Fact Summary

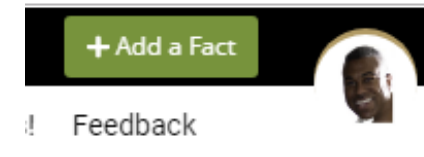
Creating a Fact:

1. Select the Fact Type.
2. Select values based on Fact Type (i.e. Date).
3. Create Fact Content by:
 - a. Typing Title / Summary / Text.
 - b. Copy / Paste / Type Url and click Url button.
 - c. Load Word document from computer by clicking Word button.
 - d. Load Adobe Acrobat document from computer by clicking Acrobat button.
 - e. Load Text file from computer by clicking Text button.
4. Edit Title / Summary / Text as needed.
5. Click the 'Step 2' arrow in the wizard bar above the data entry fields to continue.

Step 2 - Add Pictures

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This is the Add A Fact page, accessed by clicking the



button in the top right of any Blackfacts page, and logging in if necessary.



The 4 buttons by the 'Url' field enable adding Facts by pasting in a Url or uploading a Word, PDF or Text file. This presentation will demonstrate the Url scenario.



Add A Fact - Create

Blackfacts - Add Facts

blackfacts.com/add

Home About Us Marketplace Dashboard Featured My Blackfacts Just the Facts! Feedback

Facts by Date: Any Month Any Day Any Year SEARCH EVENTS

Facts by Channel: All Channels Type Search SEARCH ALL FACTS

Blackfacts.com - Black Fact Submission Page

ADD / EDIT BLACK FACTS: Logged in as Ken Granderson

Fact: -- Add New Fact --

Step 1 - Create Your Fact Step 2 - Add Pictures Step 3 - Categorize Step 4 - Submit Fact Done!

Paste a Url, copy Word / PDF file or Type your Fact

Fact Type: ☒ Article ☐ Biography ☐ Business ☐ Event ☐ Meta ☐ Organization ☐ Place ☐ School ☐ Speech ☐ Video

Url:

Title:

Summary:

Article Text:

Creating a Fact:

1. Select the Fact Type.
2. Select values based on Fact Type (i.e. Date).
3. Create Fact Content by:
 - a. Typing Title / Summary / Text.
 - b. Copy / Paste / Type Url and click Url button.
 - c. Load Word document from computer by clicking Word button.
 - d. Load Adobe Acrobat document from computer by clicking Acrobat button.
 - e. Load Text file from computer by clicking Text button.
4. Edit Title / Summary / Text as needed.
5. Click the 'Step 2' arrow in the wizard bar above the data entry fields to continue.

Step 2 - Add Pictures

Blackfacts BETA RELEASE 11.5.3

This is the result of pasting the url https://www.washingtonpost.com/opinions/elijah-cummings-we-are-in-a-fight-for-the-soul-of-our-democracy/2019/10/26/cac744be-f4fd-11e9-a285-882a8e386a96_story.html into the 'Url' field, and clicking the green globe button.

This submits the url to Aylien.com, one of 2 external services Blackfacts uses for AI analysis, to extract the article content and (hopefully) identify the main article image.

In addition to Aylien's article extraction, Blackfacts uses IBM Watson in addition to Aylien for Entity (place/place/organization) analysis, and has designed the AI service subsystem in an open manner such that we can easily add additional AI engines, like Azure Cognitive Services, AWS offerings, etc.

Other than the underlying application framework (.NET) and some freely available application widgets, the external AI systems are the ONLY third-party technologies used in Blackfacts. Everything else is our own intellectual property.



Add A Fact - Media

The screenshot shows the 'Blackfacts.com - Black Fact Submission Page' in a web browser. The page is titled 'ADD / EDIT BLACK FACTS: Logged in as Ken Granderson'. It features a progress bar with five steps: 'Step 1 - Create Your Fact', 'Step 2 - Add Pictures' (which is the active tab), 'Step 3 - Categorize', 'Step 4 - Submit Fact', and 'Done!'. Below the progress bar, there is a section for 'Main Image' and 'Fact Images'. The 'Main Image' section shows a profile picture of a man. The 'Fact Images' section is empty. Below these sections, there is a 'Drag and Drop Files Here' area and a 'Url' field with a 'Load' button. A yellow box titled 'Assigning Fact Media:' contains instructions on how to add and manage images. At the bottom, there are 'Back' and 'Step 3 - Categorize' buttons.

Blackfacts.com - Black Fact Submission Page

ADD / EDIT BLACK FACTS: Logged in as Ken Granderson

Fact: -- Add New Fact --

Step 1 - Create Your Fact Step 2 - Add Pictures Step 3 - Categorize Step 4 - Submit Fact Done!

Paste Picture Urls or upload Pictures from your computer

Main Image

Fact Images:

Drag and Drop Files Here

Url:

Assigning Fact Media:

- If you loaded your Fact from a Url, the Fact Images list will contain the images found in the page.
- You can remove 'junk' images like arrows, button icons and blank spacers by clicking the red 'x' button in the top right corner of each image.
- You can add additional images by:
 - Dragging image files from a folder in Windows Explorer / Mac Finder onto the 'Drag and Drop Files' panel.
 - Clicking the Upload Image button to upload an image file from your computer.
 - Typing or copying / pasting an image Url (in Chrome, right-click over an image and select 'Copy image address') and clicking the 'Load' button.
- Images can be dragged and dropped back and forth between the 'Fact Images' list and the 'Main Image' panel to specify the main image for the Fact.

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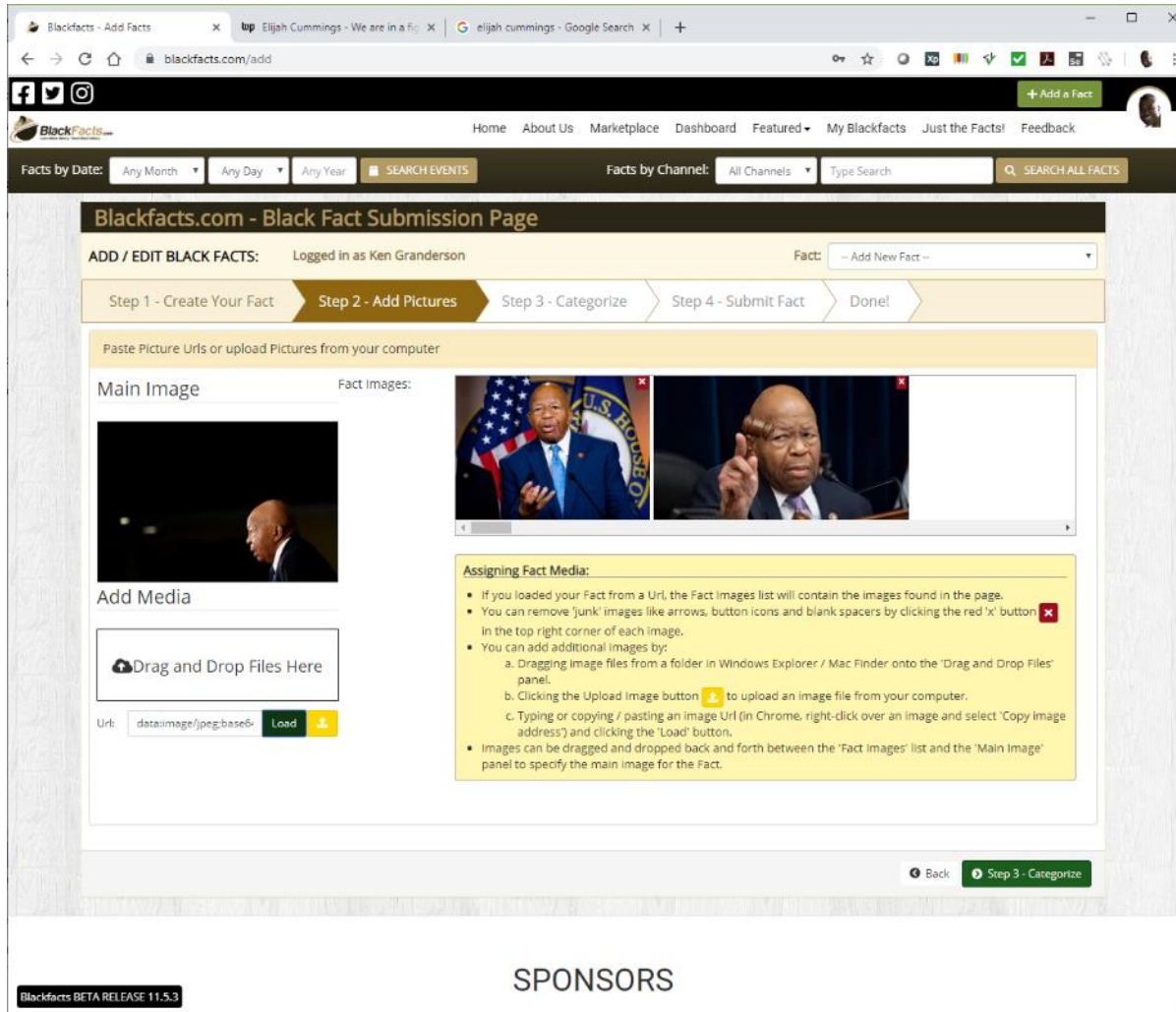
Back Step 3 - Categorize

This is the 'Add Pictures' tab, showing the main article image successfully identified by Aylien.

Additional images can be added by copying / pasting their locations for a browser page into the 'Url' field, or dragging and dropping them from your computer.



Add A Fact - Media



This is the result of doing a Google Image search for 'Elijah cummings,' right-clicking a couple of images and selecting 'Copy Image Address' and then pasting them into the 'Url' field.

Once in this screen, images can be made the Primary Fact Image (which shows up in the Fact Card view) by dragging it over to the left image box.



Add A Fact - Channels

Blackfacts.com - Black Fact Submission Page

ADD / EDIT BLACK FACTS: Logged in as Ken Granderson Fact: -- Add New Fact --

Step 1 - Create Your Fact Step 2 - Add Pictures Step 3 - Categorize Step 4 - Submit Fact Done!

Select your Fact Channels

Blackfacts.com Fact Channels:

<input type="checkbox"/> AALAS Nominees	<input type="checkbox"/> Afro-Latino	<input type="checkbox"/> Arts	<input type="checkbox"/> Birthdays
<input type="checkbox"/> Business	<input checked="" type="checkbox"/> Community Organizing	<input type="checkbox"/> Cuisine	<input type="checkbox"/> Cultures
<input type="checkbox"/> Dance	<input type="checkbox"/> Education	<input type="checkbox"/> Entertainment	<input type="checkbox"/> Entrepreneurs
<input type="checkbox"/> Fight The Power	<input type="checkbox"/> Film	<input type="checkbox"/> Folklore and Myth	<input type="checkbox"/> Health
<input type="checkbox"/> Holidays	<input type="checkbox"/> How-Tos	<input type="checkbox"/> Inventors	<input type="checkbox"/> Journalism
<input type="checkbox"/> Kids	<input type="checkbox"/> Kwanzaa	<input checked="" type="checkbox"/> Law	<input type="checkbox"/> Lifestyle
<input type="checkbox"/> Literature	<input type="checkbox"/> Military	<input type="checkbox"/> Music	<input type="checkbox"/> News
<input checked="" type="checkbox"/> Politics	<input type="checkbox"/> Recipes	<input type="checkbox"/> Sciences	<input type="checkbox"/> Spirituality
<input type="checkbox"/> Sports	<input type="checkbox"/> Training	<input type="checkbox"/> Women	

[Back](#) [Step 4 - Submit Fact](#)

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Blackfacts Channels (also shown as Categories, oops, we will update for consistency) are human-organized groupings of Facts based on contextual similarity.

Channels are a primary grouping of Facts for search purposes, used to generate Channel Pages for Facts about Arts, Business, Politics, etc.

Several Channels (i.e. Afro-Latino) will not appear in the main Channels list until they contain enough content to fill up a Channel page. Including them in the Add A Fact page (and adding new Channels based on submissions) enables us to have new Channels reflect user interests.

Facts by Channel: All Channels Type Search [SEARCH ALL FACTS](#)

Channels are distinct from Categories, which are automatically classified by the AI engines, and are over 430 in number.



Add A Fact - Ownership

Blackfacts.com - Black Fact Submission Page

ADD / EDIT BLACK FACTS: Logged in as Ken Granderson

Fact: -- Add New Fact --

Step 1 - Create Your Fact Step 2 - Add Pictures Step 3 - Categorize Step 4 - Submit Fact Done!

Confirm your Fact Source Authorship

At Blackfacts.com, one of our core principles is to use our platform to support independent and commercial authors who create content that documents Black History.

We also support and respect copyrights and want to use other folks' content only in the context of the Fair Use Doctrine, as we do not create content, but create technology to help promote content written by others.

Thus, when you submit something to Blackfacts, we need you to tell us whether it is something that you wrote yourself (in which case we will display the full text on the Blackfacts Fact Details Page), or is something you linked to or copied from an external source (in which case we will only display the Summary on the Blackfacts Fact Details Page and will link to the full content).

☐ My submission is original content. The full text will be displayed on BlackFacts.com.

☐ My submission is from a link or other already existing content. Only the Summary will be displayed on BlackFacts.com, with a link to the full content online.

Confirming Your Fact:

1. If you wrote your Black Fact or know that you have permission to post it in its entirety, click the option on the left.
2. If your Black Fact is from a remote URL, click the option on the right.
3. Then, click the Save button to save your Fact.

☒ I'm not a robot

Back Save Your Fact!

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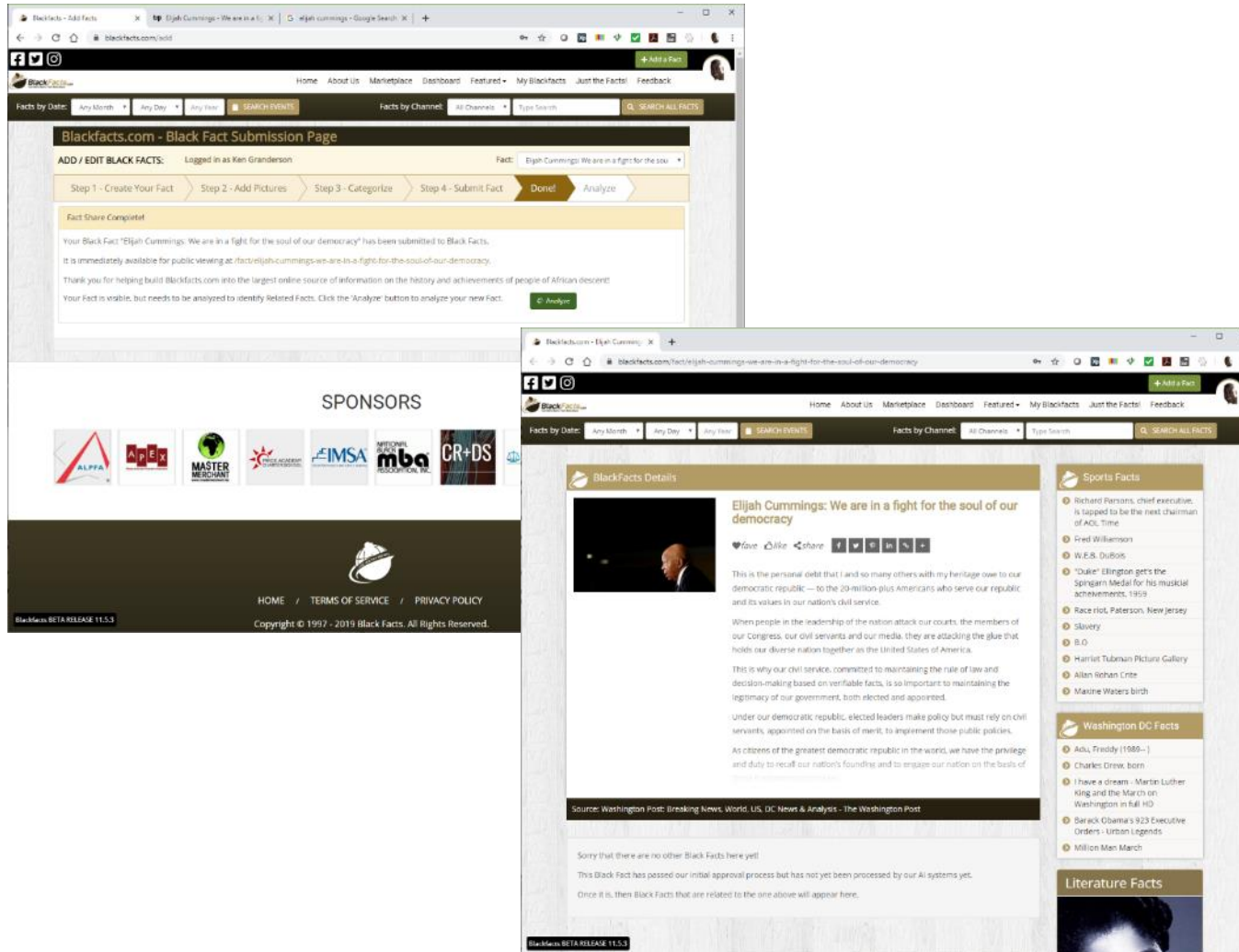
Blackfacts BETA RELEASE 11.5.3

The last step (for non-Admins) of Adding a Fact is indicating whether the submitted Fact is your own content, or shared from another source.

Blackfacts uses this information to control the amount of content displayed directly on Blackfacts before linking to the original source, so that we can stay in compliance with the Fair Use Doctrine and ensure that we are promoting sites that create and publish Black History content rather than replacing them.



Add A Fact – Done!



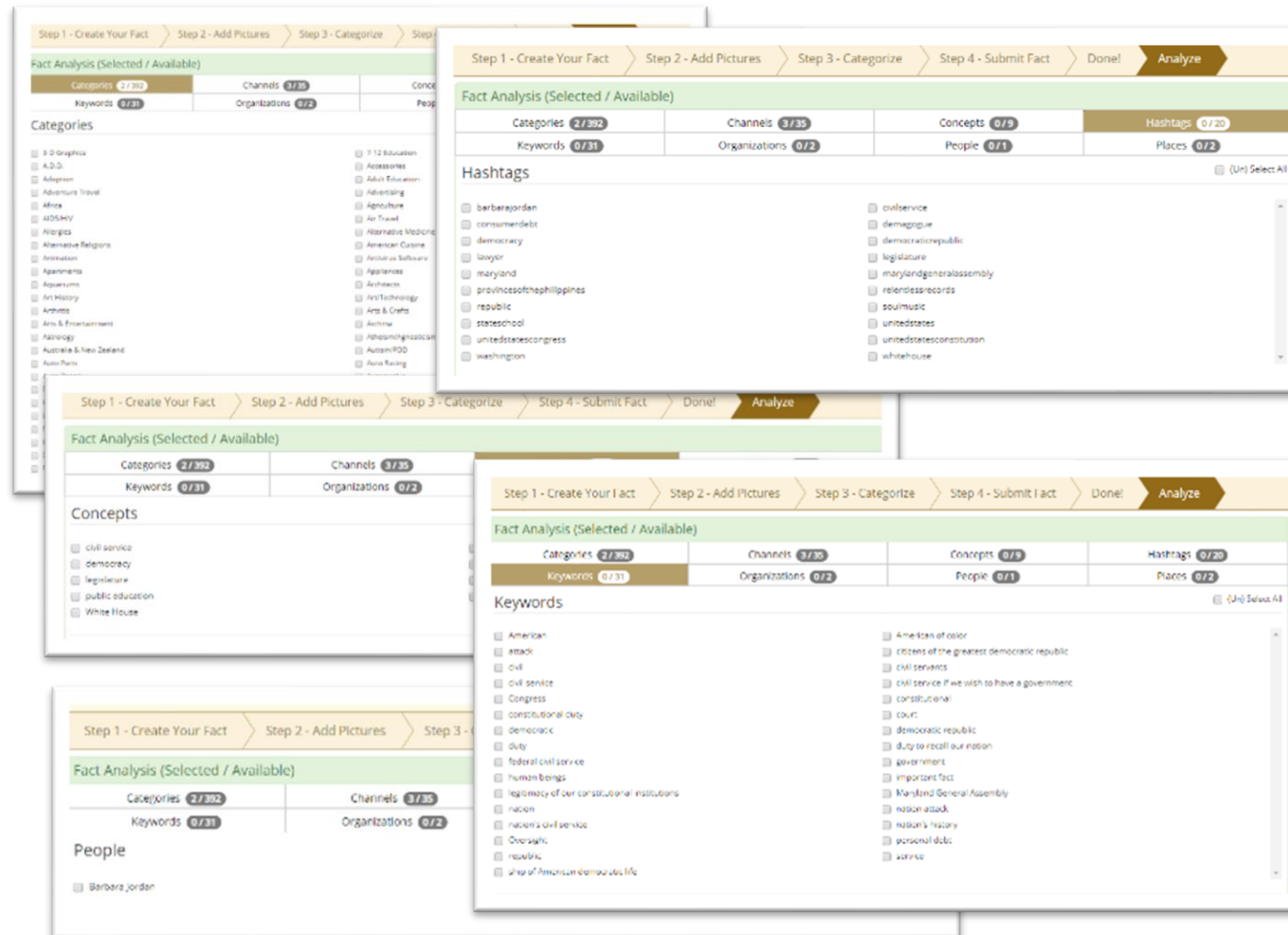
As I am an Admin, my 'Add A Fact' submissions are automatically accepted, and my submission is immediately available on Blackfacts, although as shown under the Fact Details widget, this new Fact has not yet been linked to any other Facts.

This is because I have not yet submitted the Fact to our Fact Analysis process, because we are currently not using trained AI models and so without human intervention, accepting all analysis results will generate an abundance of contextually irrelevant linkages, as well as the fact that the AI analysis costs money after a certain level of usage.

Back on the 'Add A Fact' page, I will click the 'Analyze' button to submit the new Fact for AI Analysis.



Add A Fact – AI Analysis



Blackfacts submits the entire Fact content to the 'Natural Language Understanding' services of Aylien and Watson, and returns their identification of the following:

- Categories (based on a standard IAB list)
- Concepts
- Hashtags
- Keywords
- Organizations
- People
- Places

As shown in the screen captures, the results can often be less than comprehensive or accurate 😞

To be fair, sparse results like this are also often the result of content where people are discussing things that mattered TO the subject, rather than the subject themselves.



Add A Fact – AI Analysis

The screenshot shows the 'Add A Fact' page on the Blackfacts website. The user is logged in as Ken Granderson. The fact being added is 'Elijah Cummings: We are in a fight for the soul'. The interface shows a progress bar with five steps: Step 1 - Create Your Fact, Step 2 - Add Pictures, Step 3 - Categorize, Step 4 - Submit Fact, and Done! The 'Analyze' button is highlighted. Below the progress bar, a table shows the fact analysis results:

Fact Analysis (Selected / Available)			
Categories 2 / 392	Channels 3 / 35	Concepts 0 / 9	Hashtags 0 / 20
Keywords 0 / 31	Organizations 1 / 3	People 1 / 2	Places 0 / 2

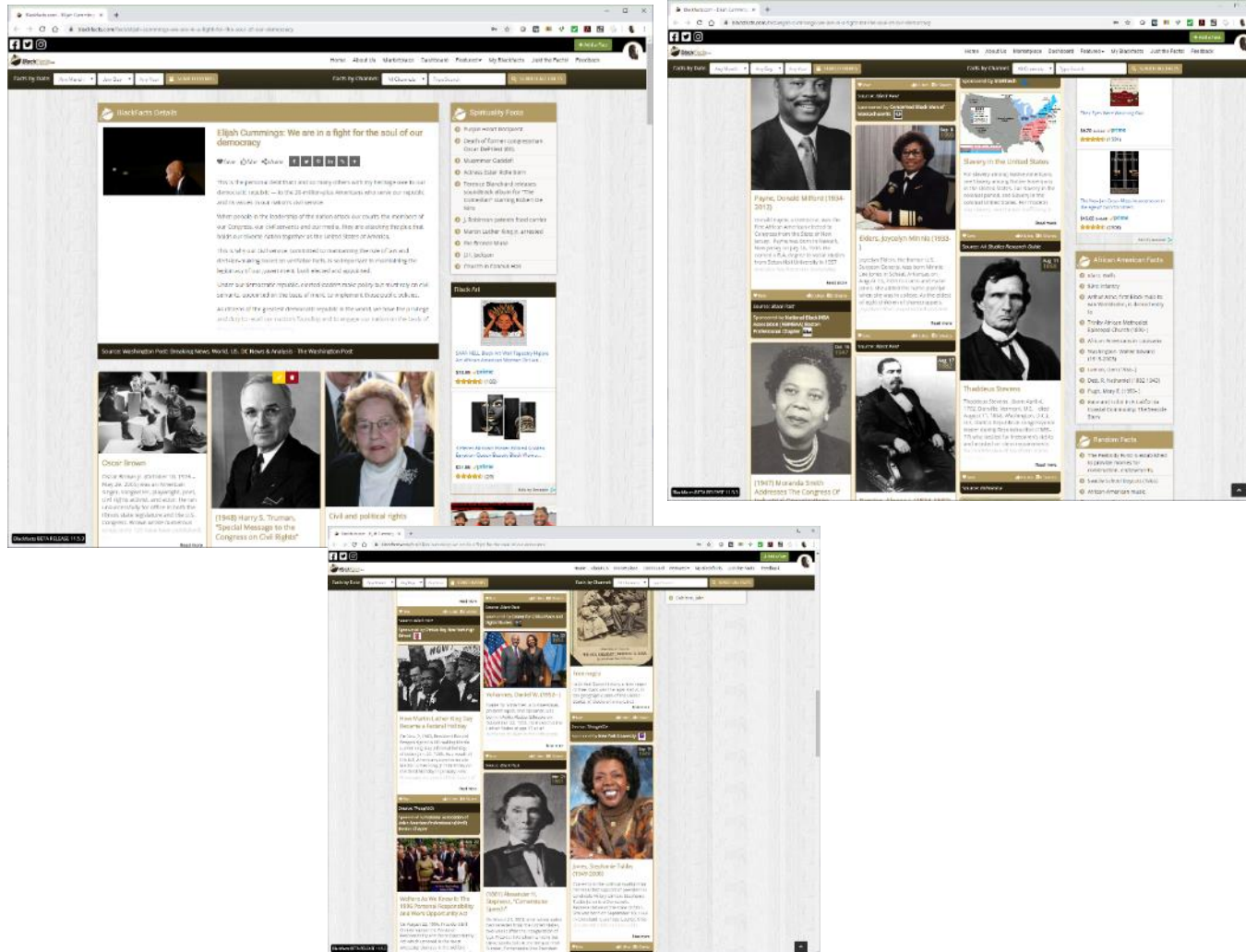
Below the table, the 'People' section is expanded, showing a list of people with checkboxes. 'Elijah Cummings' is selected. There is a 'New Person' input field with a '+' button. At the bottom right of the analysis section is an 'Update Analysis' button. The footer of the page includes a 'SPONSORS' section and a 'Blackfacts BETA RELEASE 11.5.3' banner.

As this is not surprising and actually indicative of the need for Blackfacts, we have built the ability for human operators to link Facts to People / Organizations / etc not recognized by the AI engines.

These manual linkages are stored in the Blackfacts databases, as well as an adjunct database we maintain called Blackfacts.org, for a future project concept of archiving and organizing black-related content on a global level primarily for research, rather than general consumer use.



Add A Fact – Result

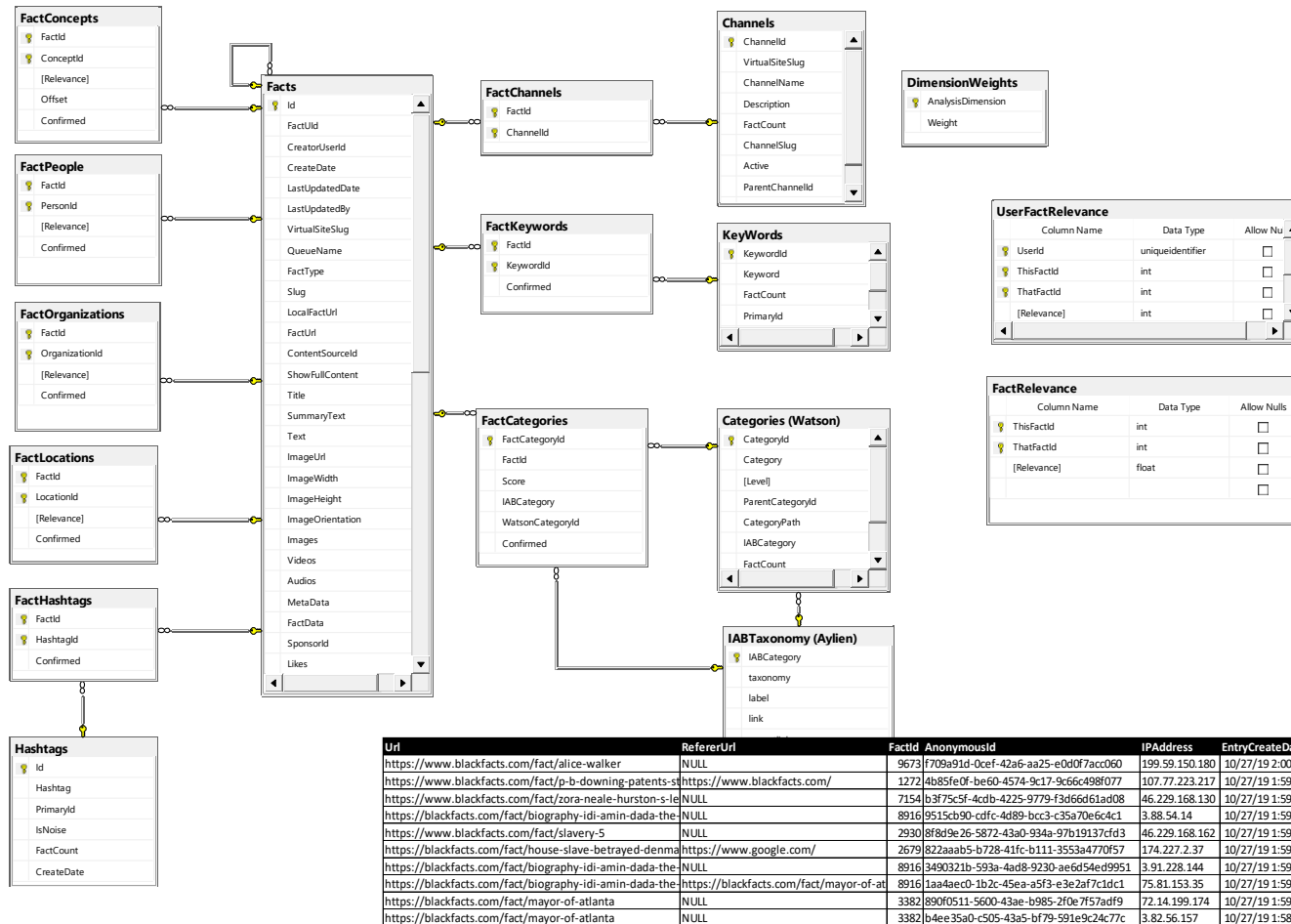


With the AI analysis data processed, reloading the page now shows other Black Facts that are related to the main Fact based on shared the AI analysis entities.

While the Blackfacts tech that reads external content, submits the content to the AI engines and then displays the content based on the analysis is doing its job, the inability of the AI engines 'out of the box' to provide richer and more contextually relevant linkages is preventing Blackfacts from delivering higher quality results.



Add A Fact – AI Analysis Challenges and Solutions



With our robust data models for both Fact analysis relationships and user activity, with better AI engine results, Blackfacts has the ability to generate more and more relevant Fact linkages as the basis for future features like:

- More Facts like this
- Show me more about subjects I like
- Show me more about subjects I don't know about
- Others who found this interesting
- Facts I might be interested in
- etc

We are confident that higher accuracy is achievable by using the learning data model capabilities of any of the AI engines. However, unlike the Natural Language Processing features that are offered at low volume for free, custom learning models have costs that will only be realistic to incur after Blackfacts has either achieved profitability through service offerings, or has secured significant external financing.





Ideas?

Hopefully this presentation illustrated our AI challenges.

While I am the sole architect and developer of the Blackfacts platform, I am NOT knowledgeable about AI or data science, so we are looking for ideas from those in those universes for how we might improve our AI engine results to improve accuracy, reduce manual work and thus increase the potential for scalability.

Feel free to contact me with thoughts and suggestions. Also feel free to share this with others who may be able to help. Thanks!



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