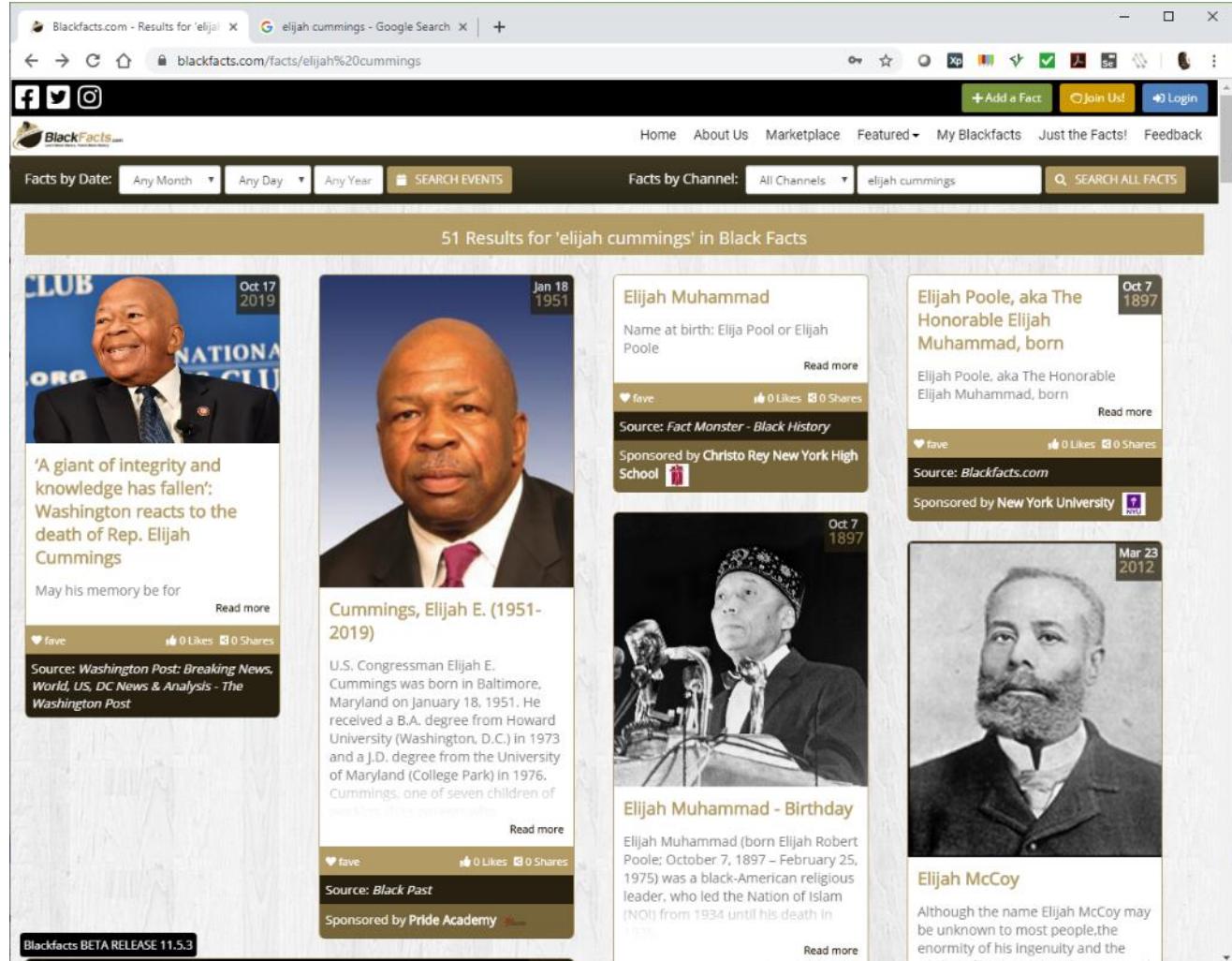




AI Analysis Challenges

Improving the Results from AI Technologies in Blackfacts

TL;DR Verison (Detailed Versions in Subsequent Slides)



The screenshot shows a web browser with two tabs: 'Blackfacts.com - Results for elijah' and 'elijah cummings - Google Search'. The main content is a search results page for 'elijah cummings' on Blackfacts.com. The page title is '51 Results for "elijah cummings" in Black Facts'. The results are displayed in a grid format:

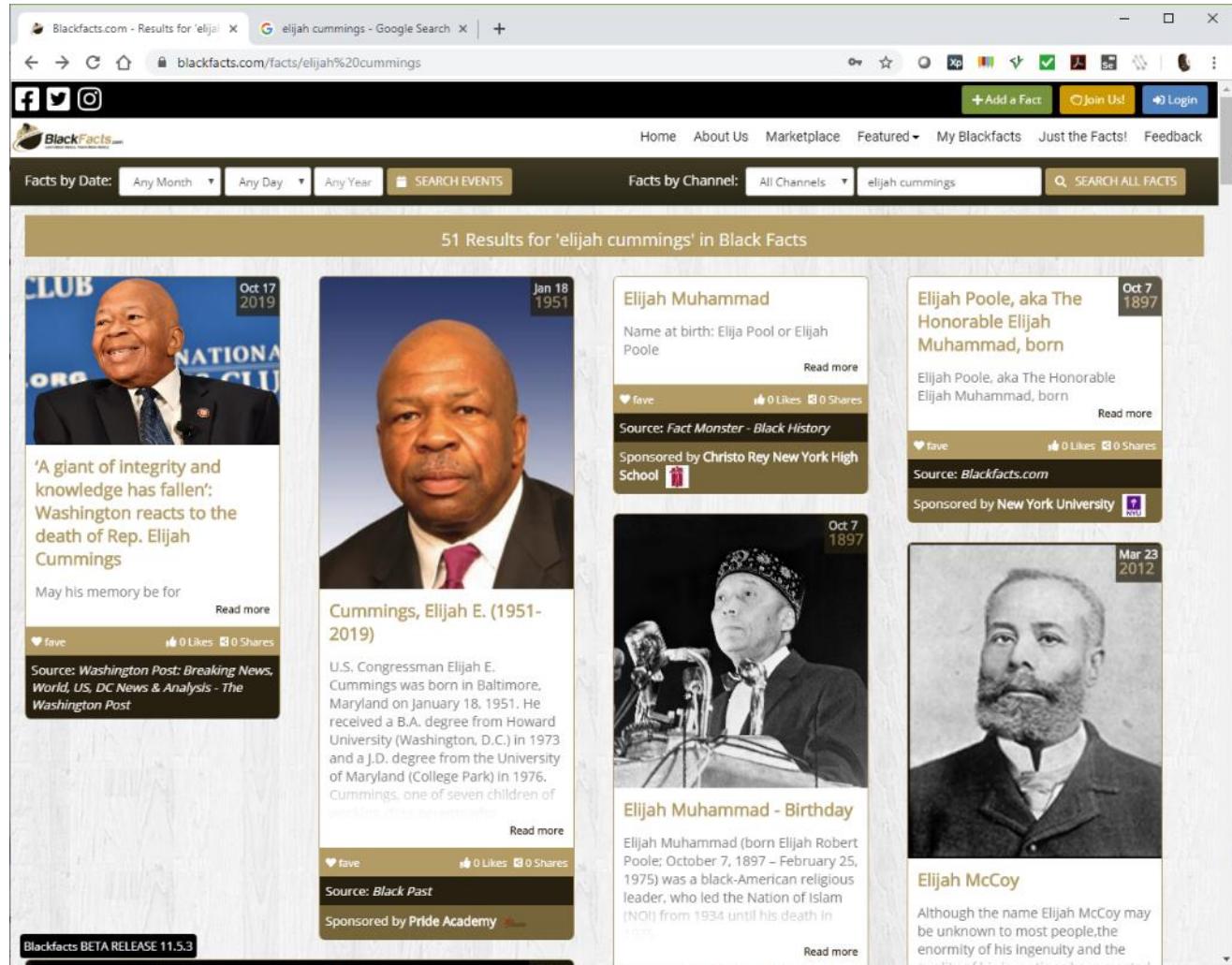
- Result 1:** A photo of Elijah Cummings with the caption: 'A giant of integrity and knowledge has fallen: Washington reacts to the death of Rep. Elijah Cummings'. Below the photo is a quote: 'May his memory be for...'. The source is 'Source: Washington Post: Breaking News, World, US, DC News & Analysis - The Washington Post'.
- Result 2:** A photo of Elijah Cummings with the caption: 'Cummings, Elijah E. (1951-2019)'. Below the photo is a brief biography: 'U.S. Congressman Elijah E. Cummings was born in Baltimore, Maryland on January 18, 1951. He received a B.A. degree from Howard University (Washington, D.C.) in 1973 and a J.D. degree from the University of Maryland (College Park) in 1976. Cummings, one of seven children of...'. The source is 'Source: Black Past'.
- Result 3:** A photo of Elijah Muhammad with the caption: 'Elijah Muhammad'. Below the photo is a brief biography: 'Name at birth: Elia Pool or Elijah Poole'. The source is 'Source: Fact Monster - Black History'.
- Result 4:** A photo of Elijah Muhammad with the caption: 'Elijah Poole, aka The Honorable Elijah Muhammad, born'. Below the photo is a brief biography: 'Elijah Poole, aka The Honorable Elijah Muhammad, born'. The source is 'Source: Blackfacts.com'.
- Result 5:** A photo of Elijah Muhammad with the caption: 'Elijah Muhammad - Birthday'. Below the photo is a brief biography: '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'. The source is 'Source: Wikipedia'.
- Result 6:** A photo of Elijah McCoy with the caption: 'Elijah McCoy'. Below the photo is a brief biography: 'Although the name Elijah McCoy may be unknown to most people, the enormity of his ingenuity and the...'. The source is 'Source: Wikipedia'.

At the bottom of the page, it says 'Blackfacts BETA RELEASE 11.5.3'.

- 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 a search results page for 'elijah cummings' on Blackfacts.com. The page header includes the Blackfacts logo, navigation links (Home, About Us, Marketplace, Featured, My Blackfacts, Just the Facts!, Feedback), and social media links (Facebook, Twitter, Instagram). The search bar shows 'elijah cummings' and the 'SEARCH ALL FACTS' button. The main content area displays 51 results. The first result is a news article from the Washington Post with a photo of Rep. Elijah Cummings and a quote: "'A giant of integrity and knowledge has fallen': Washington reacts to the death of Rep. Elijah Cummings". The second result is a photo of Congressman Elijah E. Cummings with a caption: 'Cummings, Elijah E. (1951-2019)'. The third result is a fact card for 'Elijah Muhammad' with a photo and a caption: 'Name at birth: Elia Pool or Elijah Poole'. The fourth result is a fact card for 'Elijah Poole, aka The Honorable Elijah Muhammad, born' with a photo and a caption: 'Elijah Poole, aka The Honorable Elijah Muhammad, born'. The fifth result is a photo of Elijah Muhammad speaking at a podium. The sixth result is a fact card for 'Elijah McCoy' with a photo and a caption: 'Although the name Elijah McCoy may be unknown to most people, the enormity of his Ingenuity and the'. At the bottom of the page is a footer with the text 'Blackfacts BETA RELEASE 11.5.3'.

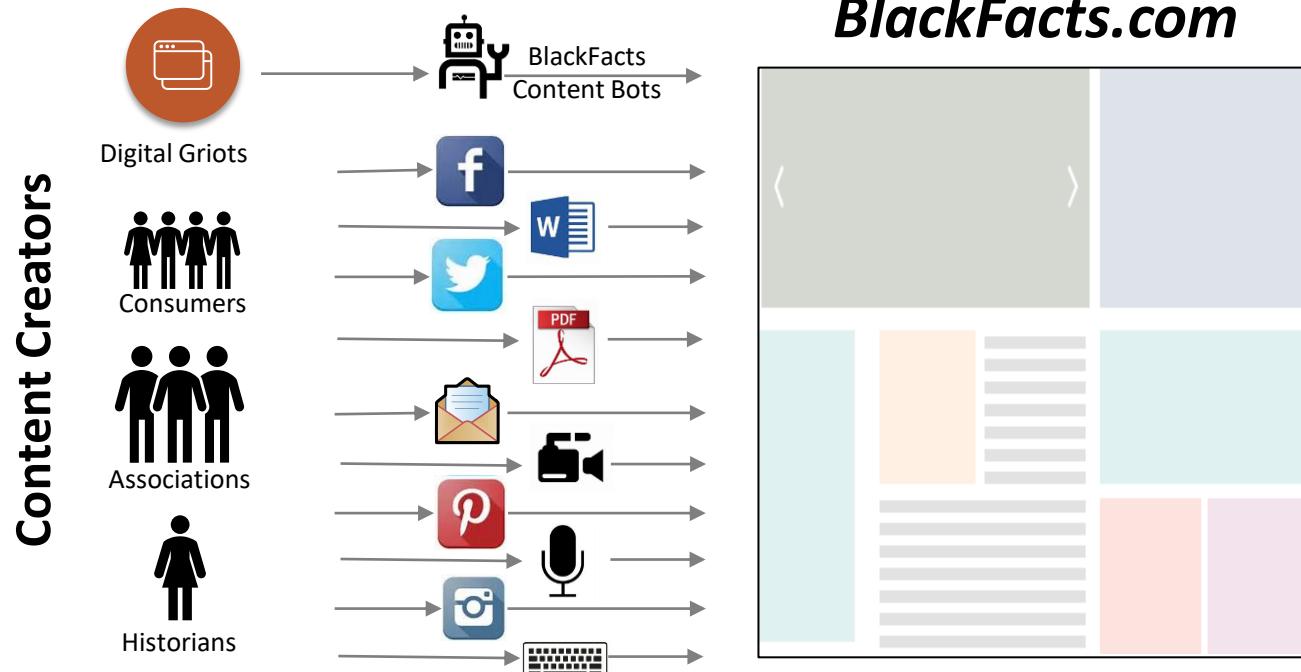
A core feature of Blackfacts is the linkage between 'Fact Cards' based on various types of searches.

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



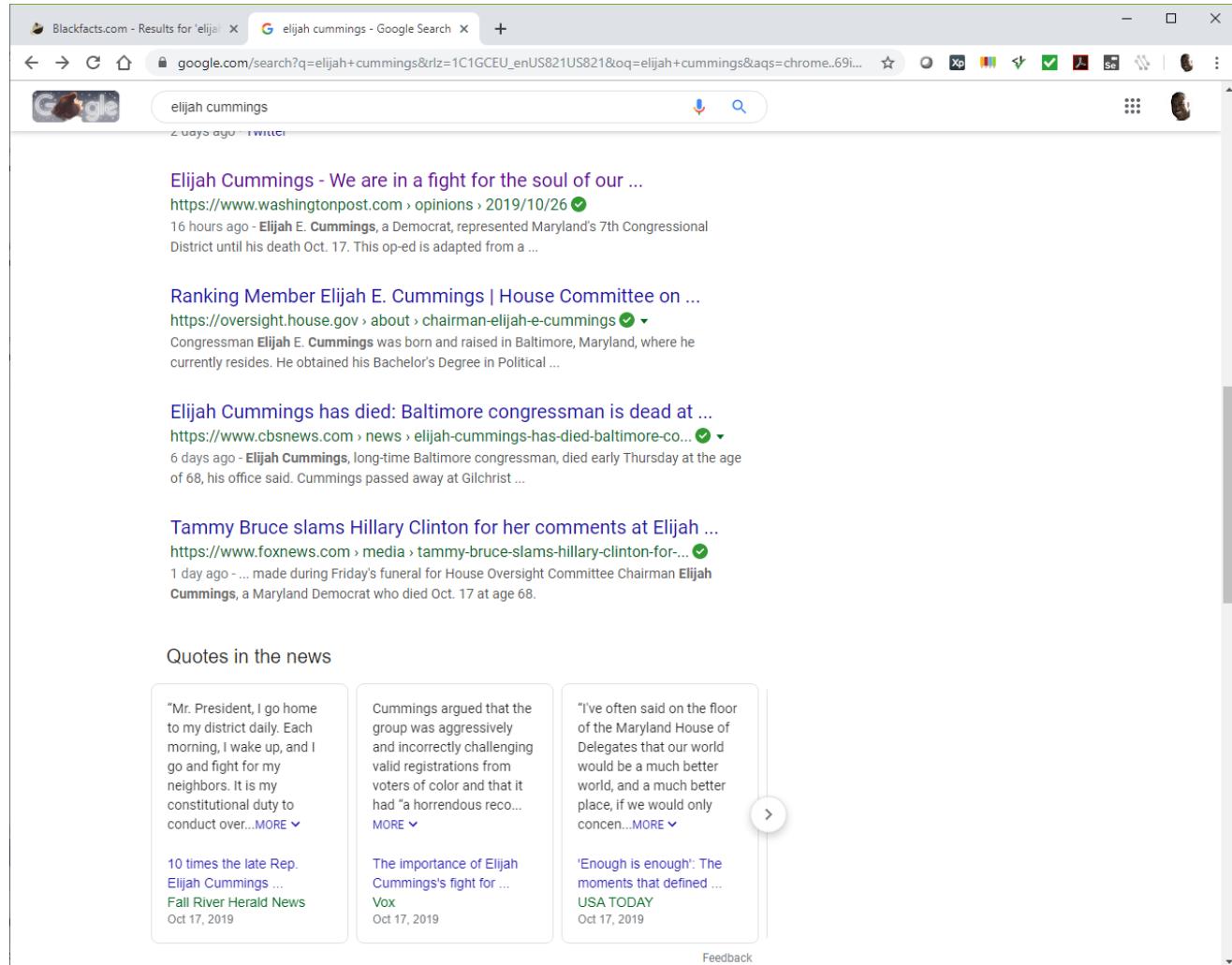
Black Facts content can come from a variety of sources, including:

- Existing Historical SiteUrls
- 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)



The screenshot shows a Google search results page for the query "elijah cummings". The results are as follows:

- Elijah Cummings - We are in a fight for the soul of our ...**
<https://www.washingtonpost.com/opinions/2019/10/26/...> ✓
16 hours ago - Elijah E. Cummings, a Democrat, represented Maryland's 7th Congressional District until his death Oct. 17. This op-ed is adapted from a ...
- Ranking Member Elijah E. Cummings | House Committee on ...**
<https://oversight.house.gov/about/chairman-elijah-e-cummings> ✓▼
Congressman Elijah E. Cummings was born and raised in Baltimore, Maryland, where he currently resides. He obtained his Bachelor's Degree in Political ...
- Elijah Cummings has died: Baltimore congressman is dead at ...**
<https://www.cbsnews.com/news/elijah-cummings-has-died-baltimore-co...> ✓▼
6 days ago - Elijah Cummings, long-time Baltimore congressman, died early Thursday at the age of 68, his office said. Cummings passed away at Gilchrist ...
- Tammy Bruce slams Hillary Clinton for her comments at Elijah ...**
<https://www.foxnews.com/media/tammy-bruce-slams-hillary-clinton-for...> ✓
1 day ago - ... made during Friday's funeral for House Oversight Committee Chairman Elijah Cummings, a Maryland Democrat who died Oct. 17 at age 68.

Quotes in the news

"Mr. President, I go home to my district daily. Each morning, I wake up, and I go and fight for my neighbors. It is my constitutional duty to conduct over...[MORE](#)

10 times the late Rep. Elijah Cummings ...
[Fall River Herald News](#)
Oct 17, 2019

Cummings argued that the group was aggressively and incorrectly challenging valid registrations from voters of color and that it had "a horrendous reco...[MORE](#)

The importance of Elijah Cummings's fight for ...
[Vox](#)
Oct 17, 2019

"I've often said on the floor of the Maryland House of Delegates that our world would be a much better world, and a much better place, if we would only concen...[MORE](#)

'Enough is enough': The moments that defined ...
[USA TODAY](#)
Oct 17, 2019

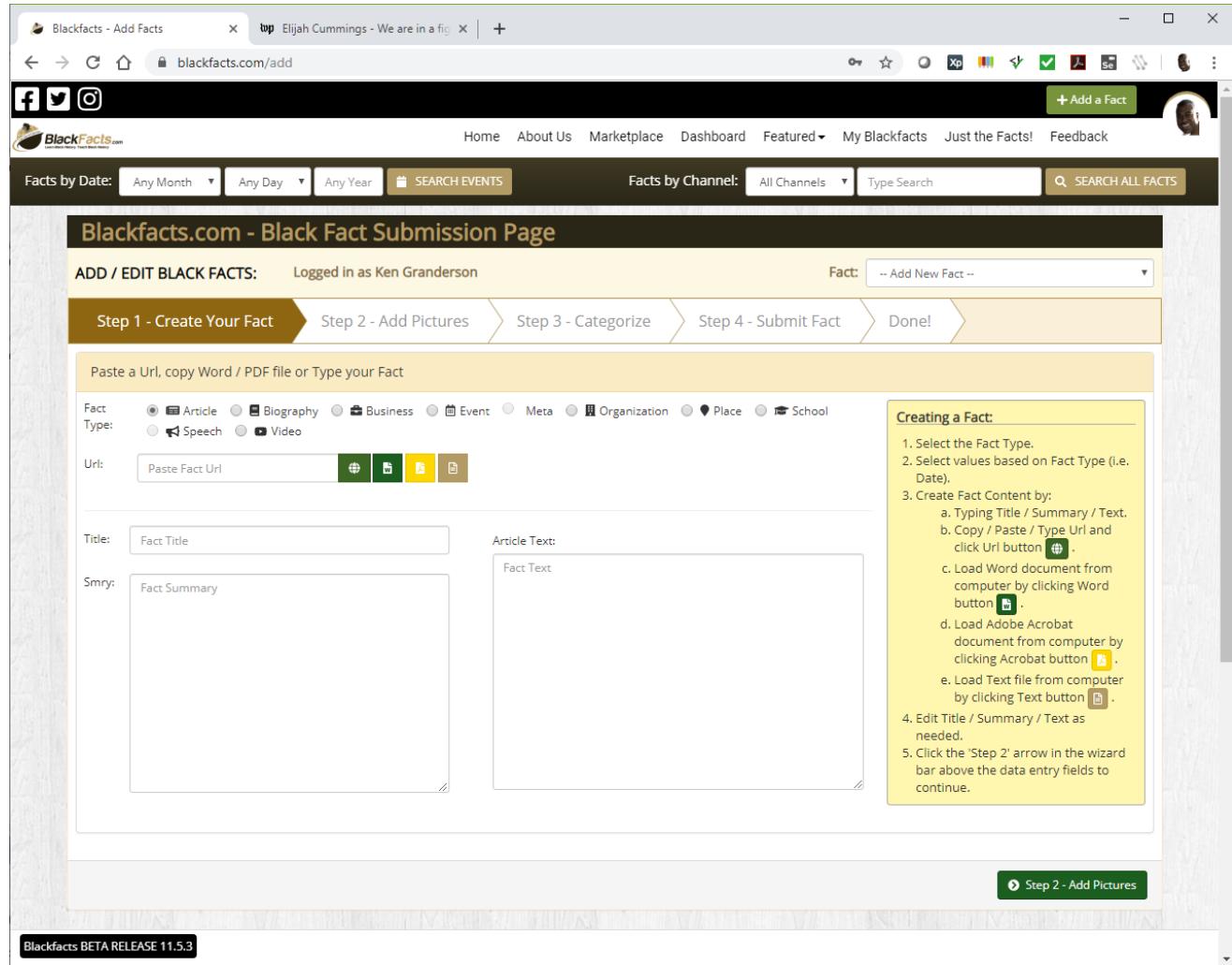
[Feedback](#)

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.

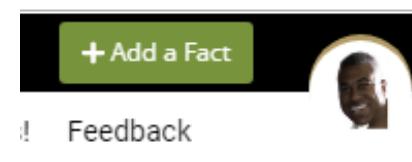


Add A Fact - Create

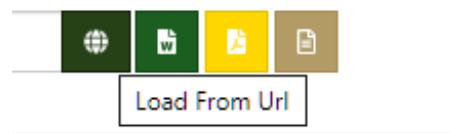


The screenshot shows the 'Blackfacts.com - Black Fact Submission Page'. At the top, there are navigation links for Home, About Us, Marketplace, Dashboard, Featured, My Blackfacts, Just the Facts!, and Feedback. A green 'Add a Fact' button is located in the top right corner. Below the navigation, there are filters for 'Facts by Date' (Any Month, Any Day, Any Year) and 'Facts by Channel' (All Channels, Type Search). The main area is titled 'Blackfacts.com - Black Fact Submission Page' and shows a progress bar: Step 1 - Create Your Fact (highlighted in brown), Step 2 - Add Pictures, Step 3 - Categorize, Step 4 - Submit Fact, and Done!. A sub-instruction box titled 'Creating a Fact:' provides steps: 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. Below this are fields for 'Fact Type' (Article, Biography, Business, Event, Meta, Organization, Place, School, Speech, Video), 'Url' (Paste Fact Url, with four file upload buttons), 'Title' (Fact Title), 'Smry' (Fact Summary), and 'Article Text' (Fact Text). A 'Step 2 - Add Pictures' button is at the bottom right. The footer of the page reads 'Blackfacts BETA RELEASE 11.5.3'.

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



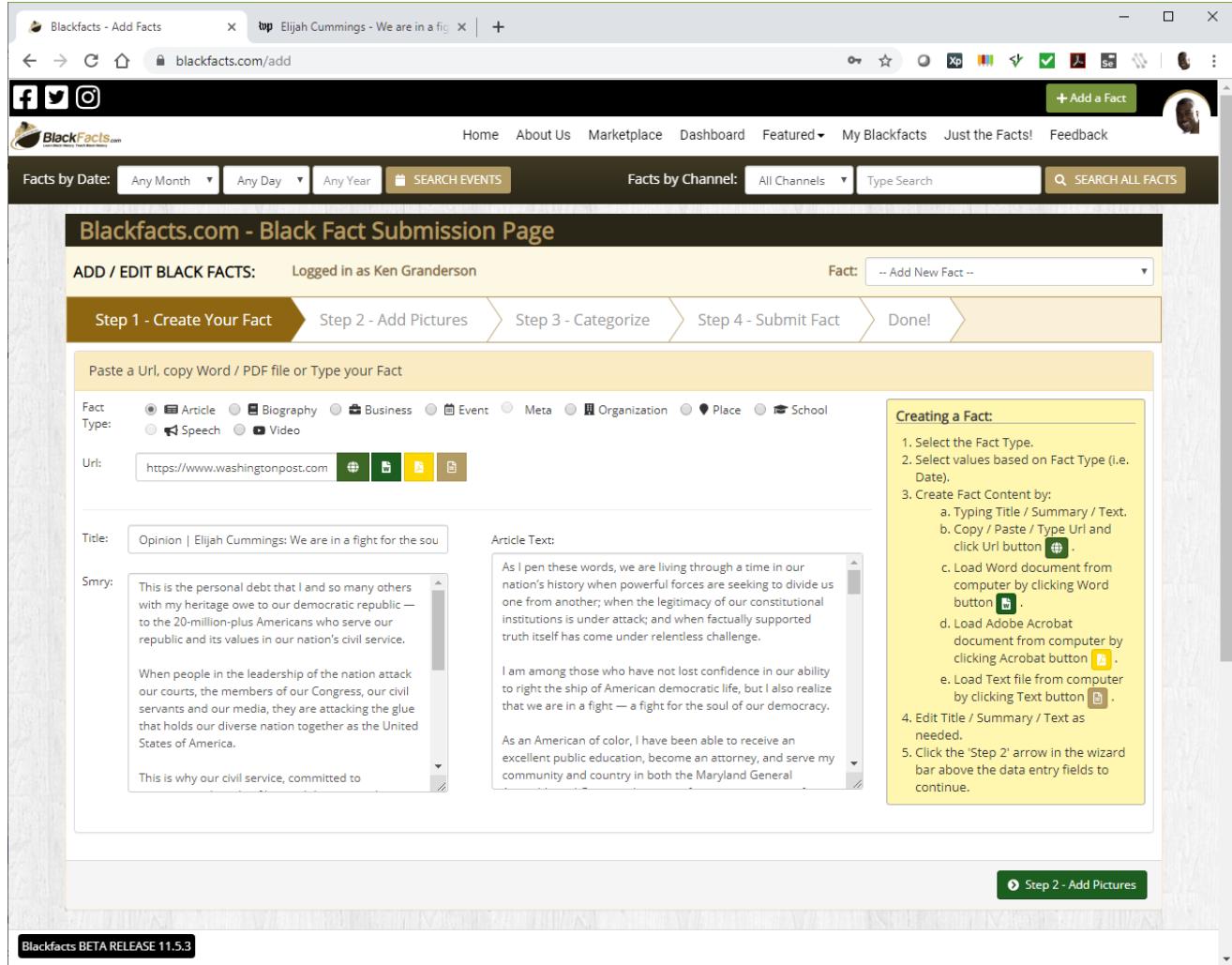
button in the top right of any Blackfacts page, and logging in if necessary.



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



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.

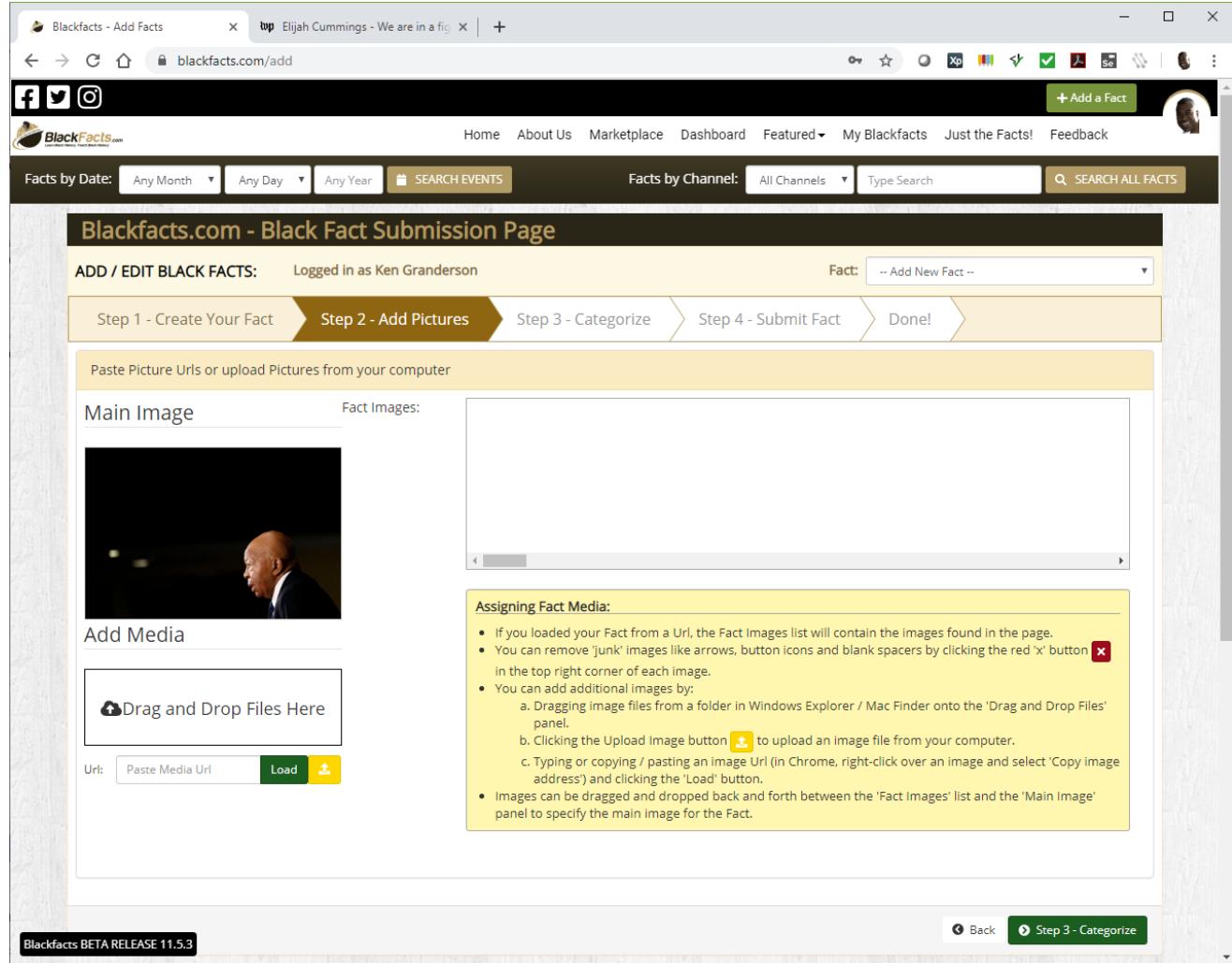
This submits the url to Aylien.com, one of 2 external services Blackfacts uses for AI analysis, to extract the article content and (hopefully) identify the main article image.

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



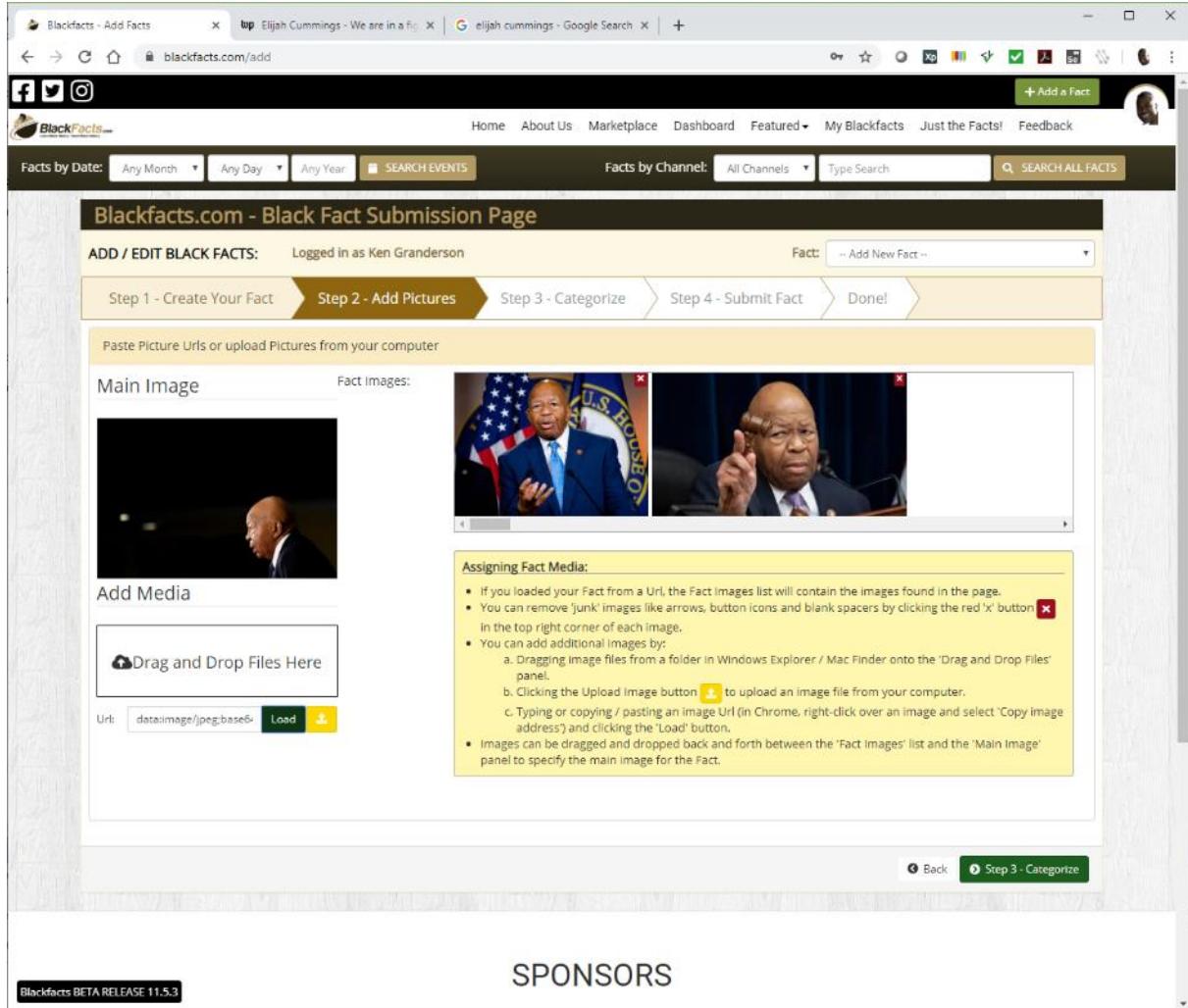
The screenshot shows the 'Blackfacts.com - Black Fact Submission Page' with the 'Step 2 - Add Pictures' tab selected. The 'Main Image' panel displays a small thumbnail of a man in a suit. The 'Fact Images' panel is empty. A yellow box titled 'Assigning Fact Media:' contains instructions for managing images. At the bottom, a note says 'Blackfacts BETA RELEASE 11.5.3'.

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

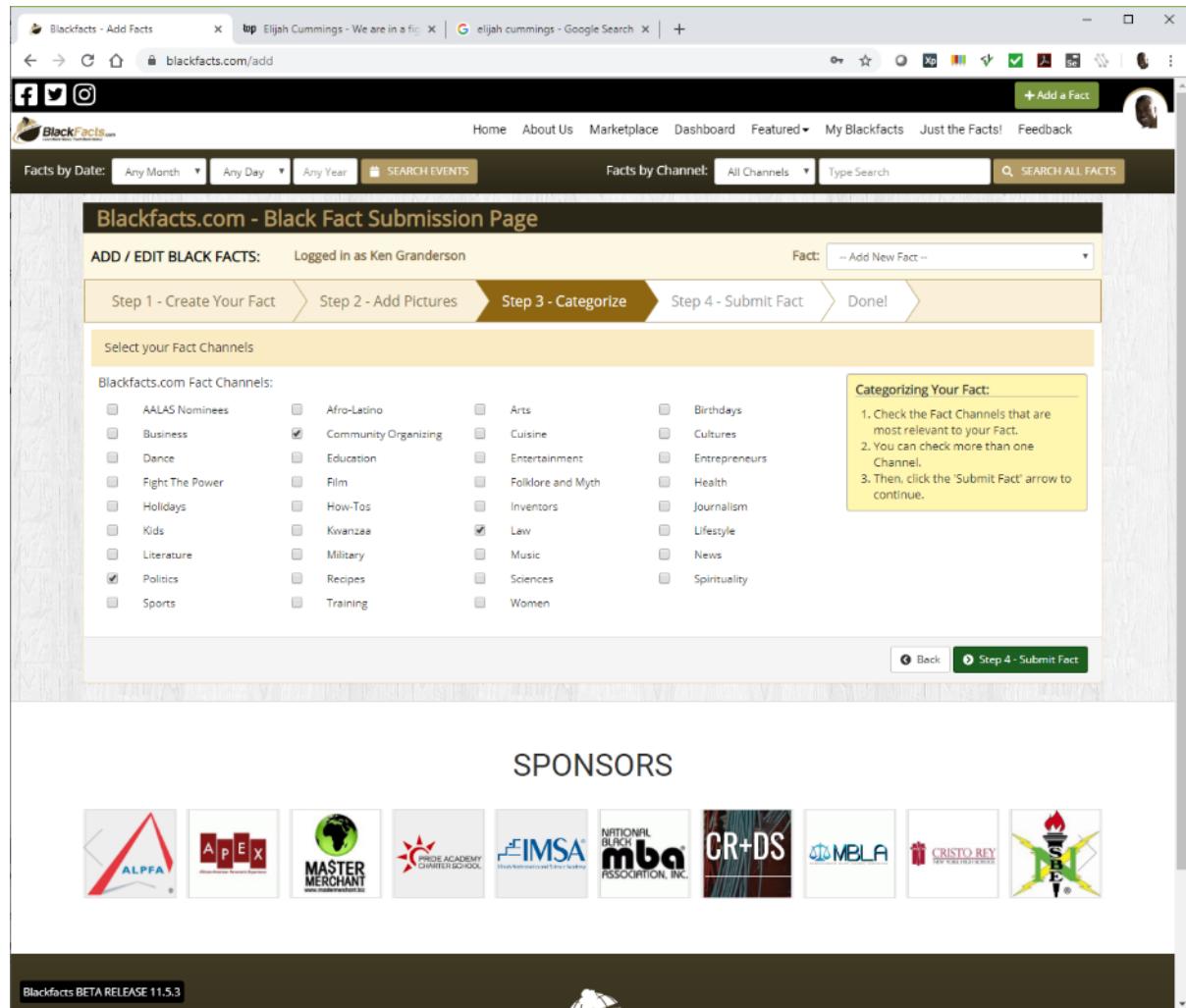


This is the result of doing a Google Image search for 'Elijah cummings,' right-clicking a couple of images and selecting 'Copy Image Address' and then pasting them into the 'Url' field.

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 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.

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

Learn ... Teach.. Create.. Black History..

10

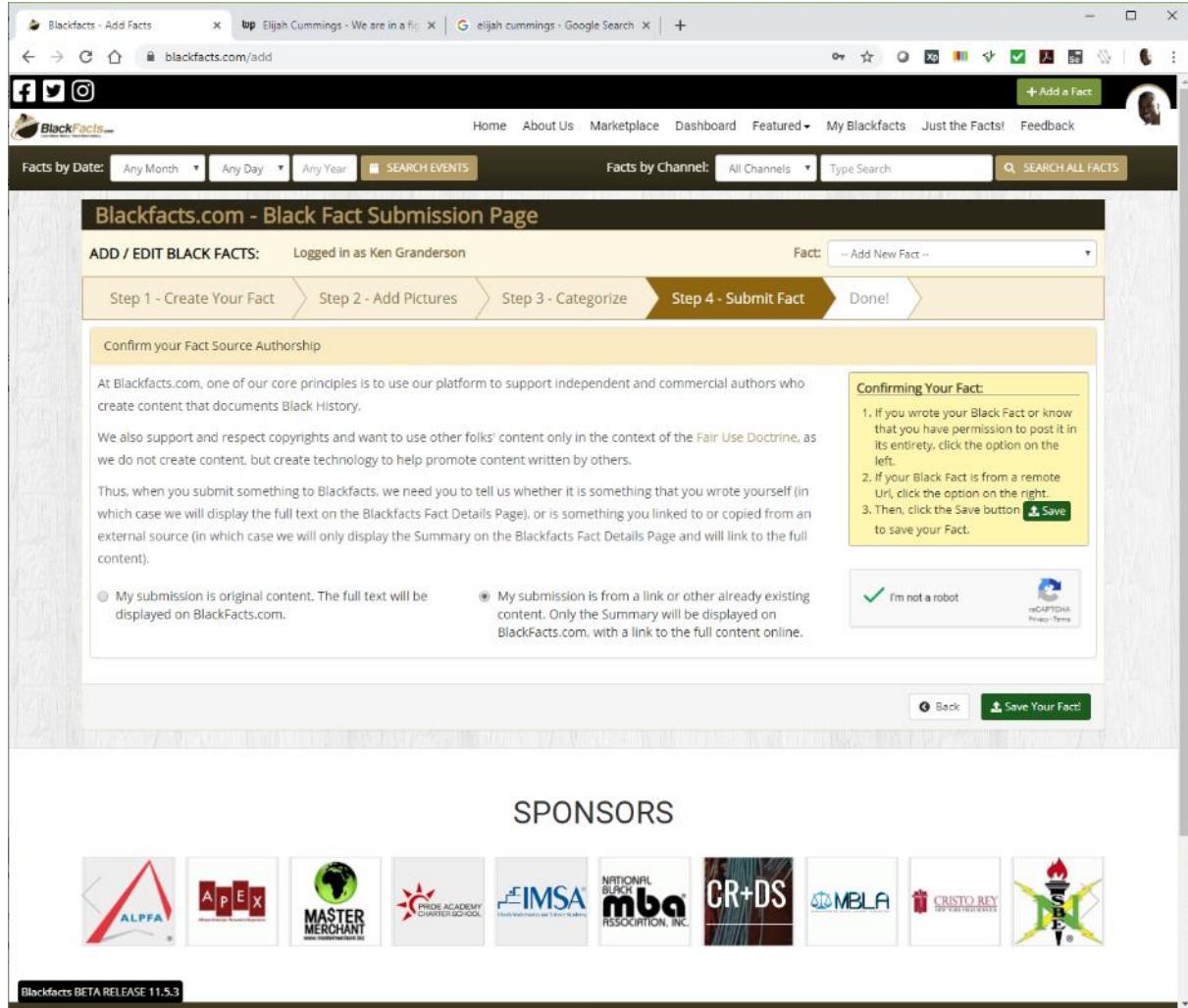


<https://blackfacts.com>

Learn ... Teach.. Create.. Black History..

10

Add A Fact - Ownership



The screenshot shows the Blackfacts.com Black Fact Submission Page. At the top, there are navigation links for Home, About Us, Marketplace, Dashboard, Featured, My Blackfacts, Just the Facts!, and Feedback. Below that is a search bar for 'SEARCH EVENTS' and 'SEARCH ALL FACTS'. The main content area is titled 'Blackfacts.com - Black Fact Submission Page' and shows the 'Step 4 - Submit Fact' step. It includes a 'Fact' dropdown, a progress bar with steps: Step 1 - Create Your Fact, Step 2 - Add Pictures, Step 3 - Categorize, Step 4 - Submit Fact (highlighted in yellow), and Done!. A yellow box titled 'Confirming Your Fact:' contains instructions: 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. Below this are two radio button options: one for original content and one for content from a link. A reCAPTCHA box is also present. At the bottom are 'Back' and 'Save Your Fact' buttons. The page footer includes a 'SPONSORS' section with logos for ALPFA, APEX, MASTER MERCHANT, PRIDE ACADEMY, IMSA, CR+DS, MBLA, CRISTO REY, and NSBE. A footer note says '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!

The top screenshot shows the 'Blackfacts - Add Facts' page. The URL is <https://blackfacts.com/add>. The page has a navigation bar with links like Home, About Us, Marketplace, Dashboard, Featured, My Blackfacts, Just the Facts, and Feedback. A sub-navigation bar for 'Facts by Date' shows 'Any Month', 'Any Day', and 'Any Year'. A search bar says 'SEARCH EVENTS'. A 'SEARCH ALL FACTS' button is on the right. The main content area says 'Blackfacts.com - Black Fact Submission Page' and shows a progress bar: Step 1 - Create Your Fact (Done), Step 2 - Add Pictures, Step 3 - Categorize, Step 4 - Submit Fact (Done), Analyze (button). A message says 'Fact Share Complete! Your Black Fact "Elijah Cummings: We are in a fight for the soul of our democracy" has been submitted to Black Facts. It is immediately available for public viewing at fact.elijah-cummings-we-are-in-a-fight-for-the-soul-of-our-democracy. Thank you for helping build Blackfacts.com into the largest online source of information on the history and achievements of people of African descent. Your Fact is visible, but needs to be analyzed to identify Related Facts. Click the Analyze button to analyze your new Fact.' A 'Done!' button is highlighted. The bottom screenshot shows the 'BlackFacts Details' page for the fact. The URL is <https://blackfacts.com/fact/elijah-cummings-we-are-in-a-fight-for-the-soul-of-our-democracy>. The page has a navigation bar and a 'SPONSORS' section with logos for ALPPA, APEX, MASTER MERCHANT, PRIDE ACADEMY, LEIMSA, NATIONAL MBA ASSOCIATION, and CR+DS. The main content area shows a thumbnail of Elijah Cummings, the fact title, and a summary: 'This is the personal debt that I and so many others with my heritage owe to our democratic republic — to the 20-million-plus Americans who serve our republic and its values in our nation's civil service.' Below the summary is a 'Source: Washington Post: Breaking News, World, US, DC News & Analysis - The Washington Post'. The right sidebar lists 'Sports Facts' (Richard Parsons, Fred Williamson, W.E.B. DuBois, Duke Ellington, Jackie Robinson, Race Riot, Paterson, New Jersey, Slavery, Harriet Tubman, Alan Rehman, Maxine Waters), 'Washington DC Facts' (Adolf Hitler, Charles Drew, Martin Luther King, Barack Obama, Million Man March), and 'Literature Facts'.

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

The image displays four separate screenshots of the Blackfacts AI Analysis interface, each showing the results of an analysis step. The interface has a top navigation bar with tabs: Step 1 - Create Your Fact, Step 2 - Add Pictures, Step 3 - Categorize, Step 4 - Submit Fact, and Done! (or Analyze). Each screenshot includes a summary table with counts for Categories, Channels, Concepts, Keywords, Organizations, People, and Places. Below the table is a list of identified entities.

- Categories:** 2/302. Entities include: 2/302, A.D.D., Adventures, Africa, AIDS/HIV, Allergies, Alternative Religions, Animation, Apartments, Aquariums, Art History, Artists, Arts & Entertainment, Astrology, Australia & New Zealand, Auto Parts.
- Hashtags:** 0/31. Entities include: 0/31, barbarejordan, consumerebt, democracy, maryland, provincessofthephilippines, republic, stateschool, unitedstatescongress, washington, 0/20, civilservice, demogrupe, democraticrepublic, legislature, marylandgeneralassembly, relatedrecords, soulmusic, unitedstates, unitedstatesconstitution, whitehouse.
- Concepts:** 0/302. Entities include: 0/302, civil service, democracy, legislature, publiceducation, White House.
- Keywords:** 0/31. Entities include: 0/31, American, attack, civil, civil service, Congress, constitutional duty, democratic, duty, federal civil service, human beings, legitimacy of our constitutional institutions, nation, natural law service, Oversight, review, 0/20, Americanofcolor, citizens of the greatest democratic republic, civil servants, civil service if we wish to have a government, constitutional, court, democratic republic, duty to recall our nation, government, important fact, Maryland General Assembly, nation attack, nation's history, personal debt, review.

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

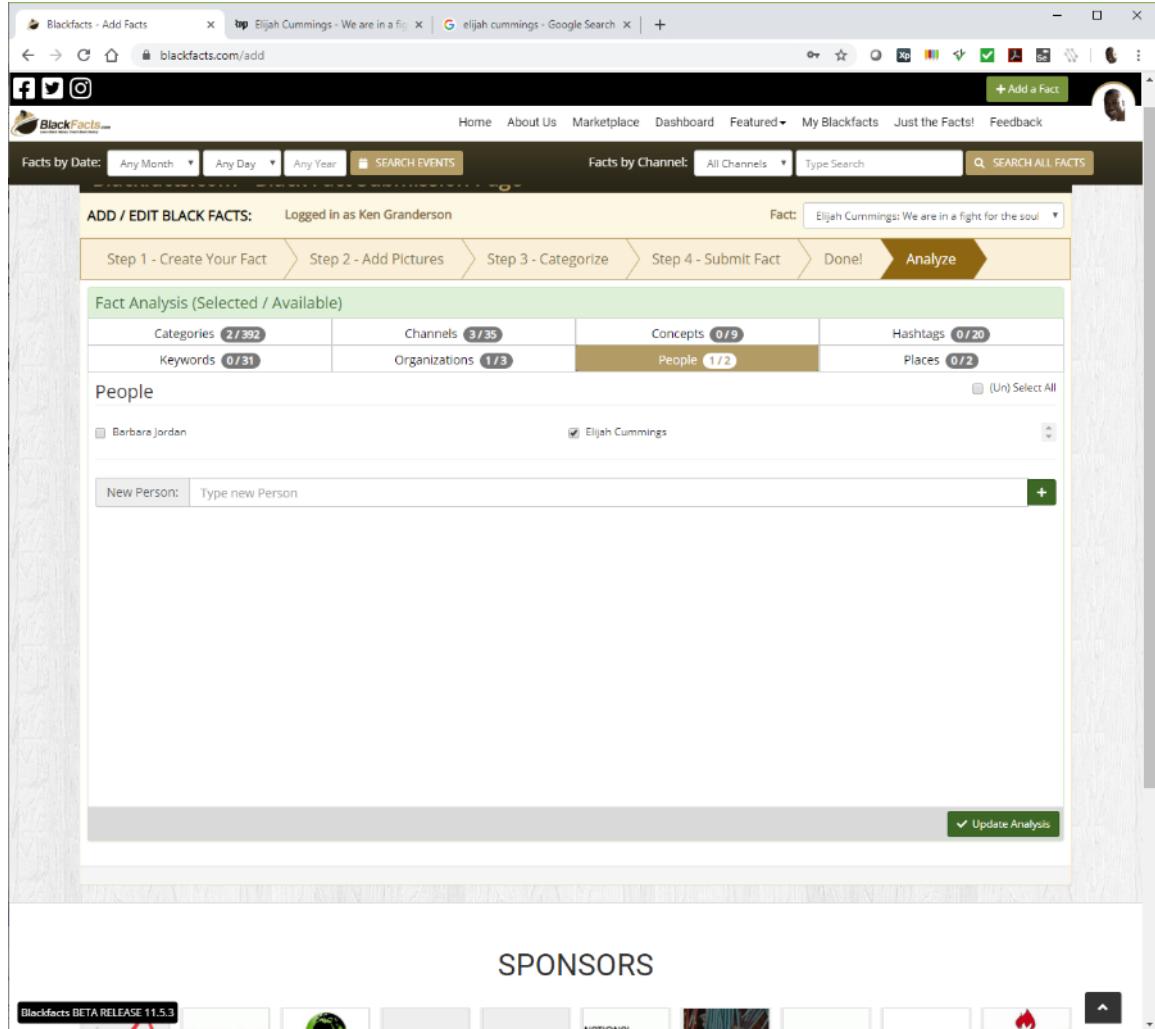
- Categories (based on a standard IAB list)
- Concepts
- Hashtags
- Keywords
- Organizations
- People
- Places

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 Blackfacts website interface for adding a fact. The top navigation bar includes links for Home, About Us, Marketplace, Dashboard, Featured, My Blackfacts, Just the Facts!, and Feedback. The main content area is titled 'ADD / EDIT BLACK FACTS' and shows the user is logged in as Ken Granderson. A fact about 'Elijah Cummings: We are in a fight for the soul' is being analyzed. The process is divided into four steps: Step 1 - Create Your Fact, Step 2 - Add Pictures, Step 3 - Categorize, and Step 4 - Submit Fact. Step 3 is currently active, with a sub-step 'Analyze' highlighted. The 'Fact Analysis (Selected / Available)' section displays the following counts:

Category	Count	Status
Categories	2 / 392	Selected
Keywords	0 / 31	Available
Channels	3 / 35	Selected
Organizations	1 / 3	Available
Concepts	0 / 9	Selected
People	1 / 2	Selected
Hashtags	0 / 20	Available
Places	0 / 2	Available

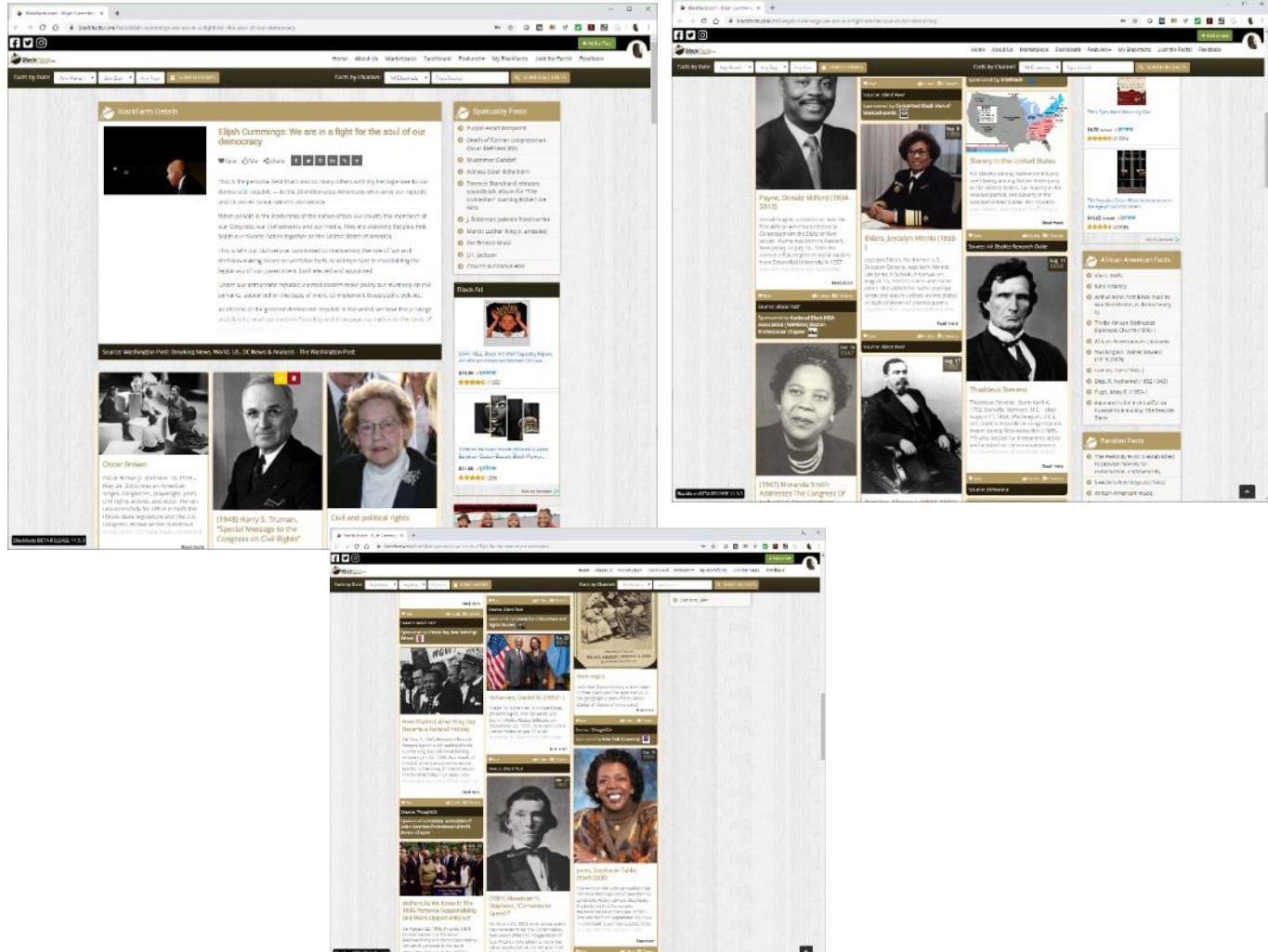
The 'People' section lists 'Barbara Jordan' and 'Elijah Cummings' as selected entities. A 'New Person' input field is also present. At the bottom of the analysis section is a 'Update Analysis' button. The footer of the page includes a 'SPONSORS' section with several small logos and the text 'Blackfacts BETA RELEASE 11.5.3'.

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

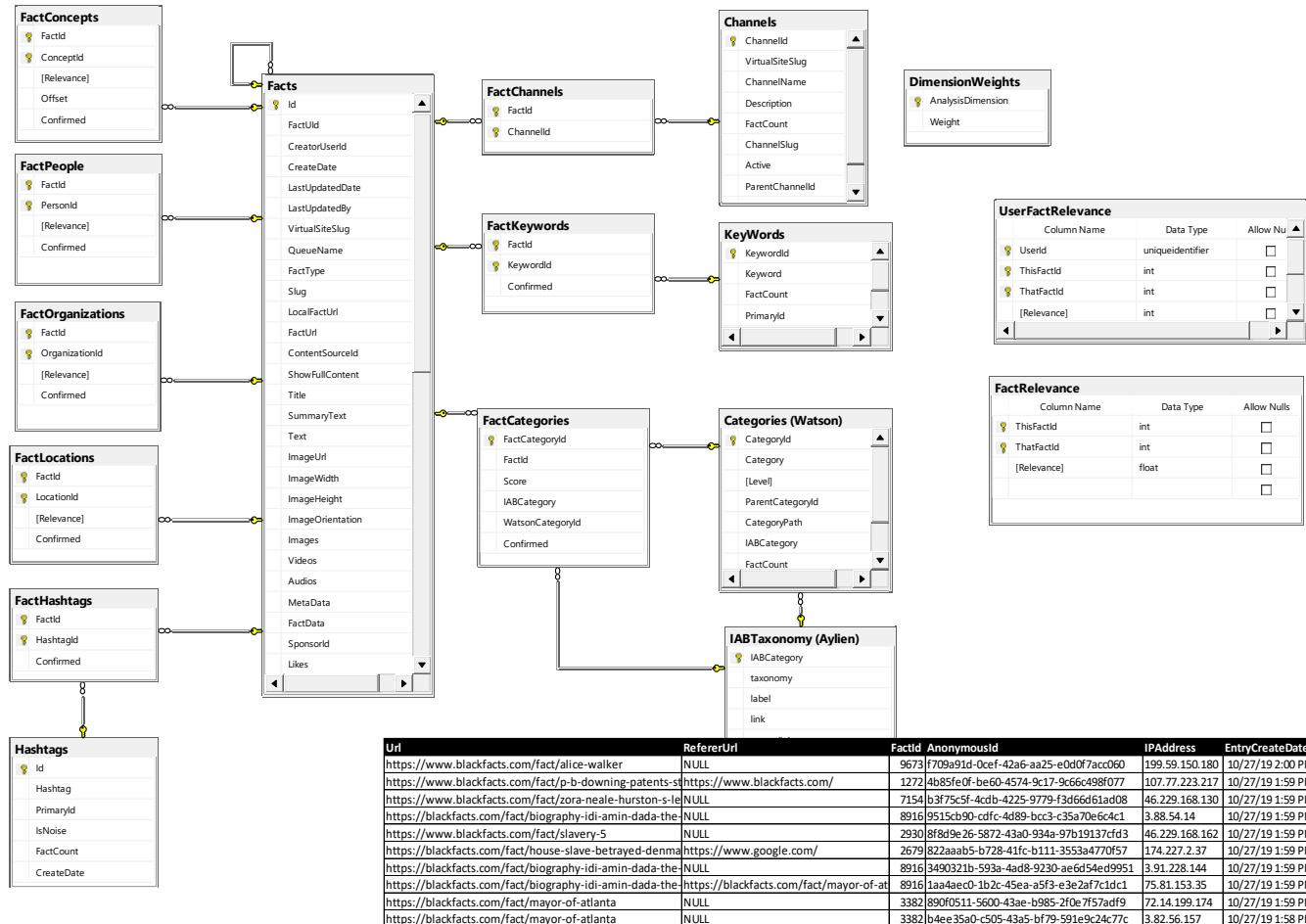


With the AI analysis data processed, reloading the page now shows other Black Facts that are related to the main Fact based on shared the AI analysis entities.

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.

Url	RefererUrl	FactId	AnonymousId	IPAddress	EntryCreateDate
https://www.blackfacts.com/fact/alice-walker	NULL	9673	f70091d-0cef-42a6-aa25-e0d0f7acc060	199.59.150.180	10/27/19 2:00 PM
https://www.blackfacts.com/fact/p-b-downing-patents-s	https://www.blackfacts.com/	1272	4b85fe0f-be60-4574-9c17-9c666498fe077	107.77.223.217	10/27/19 1:59 PM
https://www.blackfacts.com/fact/zora-neale-hurston-s-le	NULL	7154	b3f75c5f-4cd8-4225-9779-f3d66d61ad08	46.229.168.130	10/27/19 1:59 PM
https://blackfacts.com/fact/biography-idi-amin-dada-the	NULL	8916	9515c90+ccfc-4d89-bc3-c35a70e64c1	3.88.54.14	10/27/19 1:59 PM
https://www.blackfacts.com/fact/slavery-5	NULL	2930	f8d9e9e-26-5872-43a0-934a-97b9137cf3	46.229.168.162	10/27/19 1:59 PM
https://blackfacts.com/fact/house-slave-betrayed-denna	https://www.google.com/	2679	b22aaab5-b728-41fc-b111-3553a4770f57	174.227.2.37	10/27/19 1:59 PM
https://blackfacts.com/fact/biography-idi-amin-dada-the	NULL	8916	3490321b-593a-4ad8-9230-ae6d54ed9951	3.91.228.144	10/27/19 1:59 PM
https://blackfacts.com/fact/biography-idi-amin-dada-the	https://blackfacts.com/fact/mayor-of-at	8916	1aa4aecc-1b2c-45ea-a5f3-e3e2af7cd1c7	75.81.153.35	10/27/19 1:59 PM
https://blackfacts.com/fact/mayor-of-atlanta	NULL	3382	b90f0511-5600-43ae-b985-2f0e7f57ad9	72.14.199.174	10/27/19 1:59 PM
https://blackfacts.com/fact/mayor-of-atlanta	NULL	3382	b4ee35a0-505-43a5-bf79-591e924c77	3.82.56.157	10/27/19 1:58 PM





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!



- **Ken Granderson** - Founder / Chief Technology Officer
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857-222-2318



.com
BlackFacts
Learn Black History. Teach Black History

