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The Issues:

Discover sponsored content opportunities that perform well with the current social audience.

Develop tactics to create content shedding a positive light on contestants with an exhilarating tone.

The Websites:

ICPC

While ICPC's website ranks highly for searching "ICPC," searching for "computer science competition" results in ICPC's site as the seventh result. Searching for "international coding competition" and "world coding championship" results in ICPC as the top result. Ranks can be improved with some changes to how the ICPC's website is structured. The ICPC website performs moderately well on desktop, with a speed score of 74 on Google. However, the mobile speed is extremely slow, with a score of 24, according to Google's PageSpeed Insights tool. Saving photos as more efficient file types such as JPEG 2000 and JPEG XR will save an estimated 2.85 seconds of load time on mobile and 0.64 seconds on desktop. Images are placed as DIVs, rather than images, meaning that there are no alt tags. This results in lower SEO rankings and does not allow for screen readers to understand what the images contain, resulting in accessibility issues. Further, the first description of ICPC is nested in 13 div containers. The HTML head contains a title, but no description or keywords, resulting in a lack of SEO-boosting information. As the spiders used by search engines have a limited amount of time to crawl a site for information, it is best practice to place key information such as descriptions and keywords in the head of HTML. A great deal of CSS is contained within the head of this site's HTML. It is best practice to separate CSS into a separate stylesheet to improve loading times across the site.

The ICPC website is well laid out, with users only needing to make two or three clicks to get to their desired page. Information is well organized and contained within relevant menus. However, due to how the site is structured it seems that many spider programs cannot access the majority of pages. Restructuring the website with links to each page, rather than relying on javascript menus, may allow for other pages in the ICPC website–such as schedule or team pages–to appear highly on a wider variety of searches.

ICPC News

The ICPC News website has a favorable load time. Google gives the site a speed score of 91 on mobile and 99 on desktop. These are both great scores, however the speeds on mobile can be improved. Saving photos as more efficient file types such as JPEG 2000 and JPEG XR will save an estimated 1.95 seconds of load time on mobile and 0.24 seconds on desktop. Eliminating resources blocking the first section of your page to load will save an estimated 1.36 seconds on mobile and 0.49 seconds on desktop. This can be achieved by delivering critical javascript and CSS elements inline, rather than as separate resources.

ICPC News' HTML head section contains an appropriate amount of keywords and descriptions. However, finding a link to all recent stories is tough as the text size is minute. Images do not contain helpful alt tags. Including descriptions of images in alt tags, as opposed to URLs, will help to improve search engine placement and will result in people with vision impairments being able to use screen readers on your site.

There is no uniform design between pages, likely leading to user confusion. Updating the ICPC News design and crafting a unified look for the video, news, and photo sections will result in cleaner navigation and reduce user confusion. Further, moving the ICPC Stories section from Tumblr to the ICPC News site will reduce confusion and SEO fragmentation.

ICPC News has a flat page layout, requiring only one or two click to get to most, if not all, information and pages. This should be preserved. Only 14.63% of pages use the secure HTTPS protocol. HTTPS has been a signal in Google's ranking algorithms since 2014, meaning that using the HTTPS protocol may improve rankings (Blue Corona). Further, using HTTPS improves site loading speeds, which also improves SEO placement.

Reputation Analysis:

Overall, online reputation of ICPC is positive. A search was conducted on Google while signed out of all accounts and using a VPN (virtual private network) to disguise location and identity. This ensures that Google results are not influenced by previous browsing sessions or by location. Search results were classified as owned by ICPC (any website run and owned by ICPC), controlled by ICPC (social networks), third party (Wikipedia, regional ICPC sites run by universities, forums, etc.), and not applicable (results that are not about the ICPC). Sites were then classified by sentiment. Positive results used positive language about ICPC such as explaining how competitive the competition is or sites that are owned by ICPC. Neutral sites did not speak in an overtly positive manor about ICPC, but did not speak negatively. Any result that was not about ICPC or a competitor has a neutral sentiment. Results of competitors were designated a negative sentiment. It is worth noting that these results will change frequently with time and previous search history, however these results will provide a good sense of overall sentiment and share of voice.

While half of top 50 results were controlled by third parties, the majority were universities hosting information on local ICPC regional competitions. These were largely neutral, as they used the same language as the official ICPC website. Only two results were negative, as they were for a computer science conference that shares the ICPC name. This may cause confusion to some searchers, however these results are located on the second and fourth pages of results, meaning that very few users will confuse their websites for yours. Only 30% of results were owned or controlled by ICPC, but these all ranked highly, averaging a rank of 19.2.

Overall, search results are favorable. The official ICPC website ranks as number one and there are very few results with negative sentiments. Further, the first result that is not directly about the ICPC does not appear until the second page.

Table 1: Status and Sentiment of the Top 50 Google Results for "ICPC"

Status			Sentiment		
Owned	10	20.00%	Positive	25	51.02%
Controlled	5	10.00%	Neutral	22	44.90%
Third Party	25	50.00%	Negative	2	4.08%
N/A	10	20.00%	Blank	0	0.00%

There are several influential followers of ICPC on Twitter who could be converted into evangelists or enlisted for paid sponsorships. Followers were filtered to those who had tweeted in the past 7 days, had over 5,000 followers, and had an applicable account that may have an impact on computer science students or professors. These accounts vary from influencers in higher education research and computer science to organizations that computer science students may use, such as CodeChef–a coding forum with many threads dedicated to ICPC–and the Russian government's UK branch, helping Russian ex-patriots to stay connected to their home country and florist through events and tutoring.

Table 2: Potential Twitter influencers who follow ICPC

Handle	Name	Category	Location	Followers
@MantillaIgnacio	Ignacio Mantilla Prada	Higher Ed Influencer	Bogotá, D.C., Colombia	74,747
@TheOfficialACM	Association for Computing Machinery	Website/ Organization	New York, NY	49,679
@STEMconnector	STEMconnector	Website/ Organization	Washington, DC	42,953

ICPCNews @ICPCNews · Apr 4
Latin American Champions!

○ 1   ♺ 43   ♡ 65
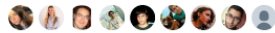
ICPCNews
@ICPCNews   [Follow]

The Latin America champions – The
Universidad Nacional de Córdoba -
FaMAF

12:33 PM - 4 Apr 2019

15 Retweets 34 Likes

○   ♺ 15   ♡ 34

Handle	Name	Category	Location	Followers
@vcuonbi	ViceChancellor,UoNBI	Higher Ed Influencer	Nairobi, Kenya	34,592
@codechef	CodeChef	Website/ Organization	Mumbai, India	23,818
@HigherEdSurge	EdSurge HigherEd	Website/ Organization	Silicon Valley, CA	20,221
@RSGovUK	Russia in the UK🇷🇺🇬🇧	Website/ Organization	37 Kensington High St., London	13,899
@sysarmy	sysarmy	Website/ Organization	#sysarmy @ freenode.net	13,863
@dorait	Dorai Thodla	Higher Ed Influencer	Chennai, India and California,	11,097
@CSTeachingTips	CS Teaching Tips	Higher Ed Influencer	Funded by NSF grant 1339404	7,595

Social Media

Twitter is an incredible platform for sharing news, updates, and tips. Twitter is well-used in western computer science and higher education communities, making the

platform a wonderful fit for sharing information, updates, and generating interest. Data was pulled from Twitter using Twitonomy–a Twitter analysis tool. The data details date, time, tweet content, number of favorites and retweets, the platform used to post (web, twitter for iPhone, Hootsuite, etc), and the type of tweet (new tweet, reply, or a retweet from another account). Data ranges from September 19th, 2015 to November 5th, 2019. Engagement is defined as a favorite or retweet.

Retweets from other accounts on the ICPC account were removed from analysis, as engagement data on retweets refers to the original tweet, rather than ICPC's retweet. For instance, if ICPC retweets a quote from @CodeWisdom, the engagement data refers to the tweet from @CodeWisdom, not differentiating any data that comes from ICPC's page. This narrows tweet types to new tweets–posts that come from ICPC–and replies–tweets replying to other tweets, either other ICPC tweets to form a thread or other users to answer questions or encouragement.

There were 72 replies, accounting for 2.25% of all pulled tweets. Replies averaged 0.42 retweets and 1.21 favorites. The majority of replies had zero to one likes and zero retweets. Replies were mostly used to answer questions and thank users for their tweets about ICPC. The most engaged-with reply, pictured in *figure 1*, provided more context to a photo showing the Latin American winning team. The majority of favorites and retweets came from members of the winning team and friends. Replies during ICPC receive more than triple the engagement than those sent outside of the conference. Replies during average 2.24 favorites and 0.72 retweets while replies

Figure 1: The most engaged-with reply on Twitter from @ICPCNews

before and after the conference average 0.68 favorites and 0.27 retweets. While this engagement is extremely low, it is worth doing that replies are providing contestants, professors, and fans with vital information and may help to craft a bond with followers.

There were 3,002 tweets (tweets that are not retweets of other users' tweets or replies to other tweets), accounting for 93.84% of all tweets pulled. Tweets during ICPC received more than double the engagement than those outside of ICPC. Those during the conference received an average of 3.73 retweets and 7.18 favorites, while those outside of the conference received an average of 1.36 retweets and 3.49 favorites. Of the top 15 tweets with the highest engagement, 14 happened during the conference. The tweet that happened outside of ICPC announced the location for ICPC 2020, reading "We are pleased to announce that the 2019 ICPC World Finals will be held in Porto, Portugal, hosted by the University of Porto and the City of Porto! March 31 - April 5, 2019 https://t.co/QIm3dTv0bN." All other top tweets detailed winners and scoreboard updates. 71% of tweets contain an image. Tweets with images have double the engagement, with an average of 5.37 favorites and 2.36 retweets, while tweets without images have an average of 2.12 favorites and 1.04 retweets. 77% of tweets contain a hashtag, the most popular being #ICPC and the corresponding year. Tweets containing hashtags receive a magical increase in engagement when compared with tweets that do not contain hashtags. Tweets containing a hashtag receive an average of 4.49 favorites and 2.06 retweets while tweets not containing hashtags

recipe an average of 4.39 favorites and 1.73 retweets. Interestingly, engagement has been declining since 2016, as shown in figure 2 below. Retweets of ICPC tweets have declined 35.78% since 2016 while favorites have remained stable.

Table 3: Engagement with ICPC Tweets

	Overall			During ICPC			Outside of ICPC		
	Engagement	RTs	FAVs	Engagement	RTs	FAVs	Engagement	RTs	FAVs
Median	3	1	2	4	1	2	3	1	2
Mean	6.29	2.08	4.44	10.91	3.73	7.18	4.85	1.36	3.49
Maximum	537	173	364	537	173	364	116	40	76
Minimum	0	0	0	0	0	0	0	0	0

Figure 2: Twitter Favorites and Retweets by Year
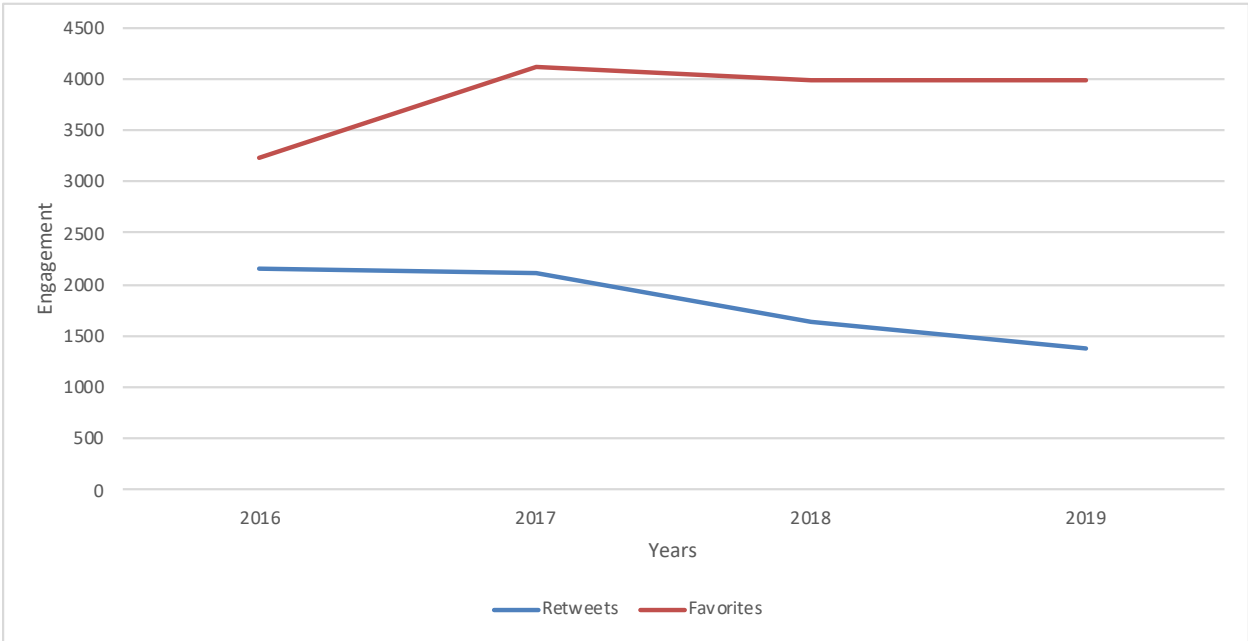
Most Engaging Twitter Content During the Contest

The most engaging tweets during ICPC contain images and the relevant ICPC hashtag. During the contest, followers engage most with tweets detailing scoreboard updates, images of contestants, and updates on winners. However, it appears that it is mostly members of ICPC teams that are engaging with content the most. While there was no

Facebook data available for during the contest, it appears that, similar to Twitter, recaps and updates on winners receive the highest engagement. Users likely follow ICPC on social platforms to see themselves or their friends or to stay up-to-date with announcements. Focusing on these types of content will likely yield more engagement.

Most Engaging Facebook Content Outside of the Contest

Of the top 15 most engaged-with posts on Facebook, six were about regional competitions, three covered alumni relations, two posed questions to followers, two were #MotivationMonday posts, one was an announcement, and one contained a quote. Twelve of these posts contained photos, one contained a link, one shared another page's video, and one had no attachments. As with Twitter, top posts contained images of competitors and attendees, particularly those on winning teams. However, unlike Twitter, posts aimed at ICPC alumni do incredibly well on Facebook. Posts detailing alumni events and showing reunions perform well with high positive engagement. As ICPC's Facebook audience skews toward the 25-34 age range. Focusing on event recaps and alumni engagement will likely yield higher engagement on Facebook.

Most Engaging Twitter Content Outside of the Contest

Twitter content and engagement outside of the ICPC contest mirrors the patterns of engagement during the contest and on Facebook. Outside of ICPC's duration, content detailing regional results and showcasing competitors do best. Outside of official location announcements, tweets containing information on teams progressing to finals and ICPC News articles on teams receive the highest engagement. Posts containing #MotivationMonday and #WisdomWednesday have received high engagement, but it is rare for them to rise to the top in 2019. Using posts with students will likely provide more engaging content during the autumn when there are few regional events.

Sponsored Content on Twitter

Current sponsored content on Twitter is rare and sparse, with only 2.58% of all tweets 2016-2018 dedicated to recognizing sponsors. Non-sponsored tweets have an average 2.47 retweets and 5.18 favorites, wile sponsored posts average 1.22 retweets and 3.51 favorites. The highest-performing sponsored tweet had 15 likes and six retweets and said "Here is one of the #ICPC2019 ICPC Challenge problems. We'd love one of those sweet Huawei prizes, but too hard for us! Good luck. https://t.co/iIBUSfpbAP." The third most engaged-with tweet followed a similar pattern, with 14 likes and three retweets, reading "Did you know #ICPC2019 World Finals Sponsor @jetbrains created the programming language Kotlin? Hear from ICPC alum who now work as part of the JetBrains team. https://t.co/3RstPKKdFE." Tweets sharing information on sponsors in a non-overt way that shares beneficial or interesting information do best. Taking a

content-marketing-based approach to sponsored messages may result in better engagement with these tweets.

There were no sponsored posts contained in the provided Facebook data.

Improving Sponsored Content

The top tweets showcasing sponsors focus on competitors and attendees, rather than the sponsors themselves. Tweets and messages showcasing the impact that sponsors have and can have on attendees and fans, especially messages paired with photos of competitors, will likely perform better. Further, including videos natively in posts, rather than as YouTube links may lead to higher engagement, as when videos are included natively, they typically play automatically, drawing users in.

Having sponsors on-site or sponsored photo opportunities could also increase engagement with sponsored posts. The 2019 ICPC photo booth created many photos and videos that were well-received on social media and as part of recap videos. Creating a sponsored booth will likely lead to similar photos and similar levels of engagement.

Creating a Sense of Excitement in Messaging

Current ICPC posts lack a sense of excitement surround the competition. Looking at similar competitions, Facebook's Hacker Cup provides insight in communicating a tone of excitement and competition via social media. Their 30 minute livestream of the result and crowning ceremony received over 12,000 views, 550 reactions, 179 comments, and 113 shares. Many comments spoke about how exciting the competition was, asking how they can follow along with similar problems and stating that they aim to earn a spot in the finals next year. Facebook also partnered with StackOverflow to showcase how they develop their problems via a StackOverflow blog post.

While Google's CodeJam does not manage to create quite the same feeling of excitement that Facebook does, they frequently interact with their Twitter followers with polls, receiving around 95 votes each time. Their tweets typically hover between 14-50 likes and five retweets during the competition. This is very similar levels of engagement to ICPC. CodeJam's Facebook page receives similar levels of engagement, with posts averaging around 30 reactions. ICPC averages 100 engagements-per-post on Facebook.

ICPC may be able to take inspiration in tone and presentation from the e-sports industry. Successful e-sports tournaments take videos of people sitting behind screens and craft them into tense, competitive, exciting videos. Google have taken inspiration from this by having their streams hosted by announces, giving play-by-play coverage of CodeJam and hosting interviews with puzzle creators and competitors. The Trade Group, an events management company who work on some of the largest e-sports tournaments, note that venue design is instrumental in creating the tone for an event both in-person and via online streams. Facebook have taken this to heart, transforming

their venue into a space that feels like a high-stakes competition with stage lighting, large screens showing scoreboards, and a large podium showcasing the Hacker Cup at all times. Further, most of Facebook's messaging surrounding the event leans on the idea of the world's top programmers battling for the top spot. A large portion of their messaging contains extremely competitive language, helping to craft a tone that their event is exciting with rockstar competitors. Emulating some of these approaches will likely help to create an increased sense of excitement for participants and viewers of the event.

Social Listening & Decision Making

How to use Social Listening Tools

Social listening tools such as Hootsuite will help to monitor follower replies, private messages, and competitors. Further, these tools will aid in collecting and interpreting data about followers, engagement, and more. Finally, these tools will allow you to schedule posts far in advance and reuse content simply and easily.

Using social listening tools goes beyond the tool itself, but requires a social media strategy that is informed by data at every stage. The first step is to develop business questions such as if posts with images receive increased engagement or if posts containing hashtags without years generate engagement for longer periods of time. Assessing how current social feeds are in response to these issues then helps to understand how current social posts are performing and provides a solid base for any key performance indicators (KPIs) and goals. Creating goals and KPIs within the social media plan is vital to assess execution and to provide insights into progress. Tangentially, these goals will also help to motivate you and remind of your incremental progress, possibly helping to maintain a feeling of sanity. A goal of increasing engagement may have KPIs to increase likes by 23%, increase the share of voice, and increase use of paid amplification to $3 per day. A goal of increasing brand awareness may have KPIs to increase organic mentions by 15%, increasing sentiment among mentions, and decreasing churn – followers who quickly unfollow.

Many social listening tools have free plans available with a decreased number of features or for a limited number of networks. For example, Hootsuite allows up to three connected networks on their free version, allowing you to connect your Facebook page, Twitter account, and YouTube or other social network like Instagram, VK, or even WeChat. Other tools include Buffer – with powerful scheduling tools but lacking in analysis – and SproutSocial – great for team-based management. All of these services have online academies and easy-to-access resources.

Social Media Goals and Key Performance Indicators

Goal: Increase engagement

    KPI: Achieve 1,750 retweets in 2020.

KPI: Increase number of posts by 20%

KPI: Increase average Facebook weekly page users to 850 (up from 721) outside of the conference.

Goal:

Online Influencers in the Computer Science Space

Simone Giertz – once known as the self-proclaimed "queen of sh*tty robots," Simone recently gained worldwide acclaim from her video detailing how she turned her Tesla into a pickup truck. She is incredibly popular in maker communities. @SimoneGiertz

Andrew Ng - A key AI influencer. The co-founder of Coursera, the former head of Baidu's AI department and Google Brain, and a member of Stanford's Computer Science adjunct faculty. @AndrewYNg

CyberCode Twins - America and Penelope Lopez are former TedX speakers, MIT Blockchain Media Lab alumni, and stream each week on the power of blockchain and crypto currencies. They have previously competed in hackathons and competitions such as such as the NASA International SpaceApps Challenge, AT&T Developer Summit, HackForLA, and the IBM Global Mobile Innovators Challenge. @cybercodetwins

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