

Understanding the Cultural Value of Twitter Conversations around the South Asia Season



Digital Data Analysis Report

This research forms part of the evidence for the Cultural Value Project

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Cover image: Polishing Lapis, Turquoise Mountain 2013, British Council website
<http://design.britishcouncil.org/projects/gem/>

Executive Summary of Findings

The British Council UK-South Asia season, ran during the autumn of 2013 to celebrate and explore the cultural relationship and connections between the UK and South Asia.¹ To fulfil this aim, the British Council sought to promote opportunities to connect, create and collaborate in the fields of education and culture between the UK and countries across the region, namely India, Sri Lanka, Pakistan, Afghanistan, Bangladesh, Nepal and Iran.

The results presented in this report focuses specifically on the elements of the season which appeared on Twitter and covers two distinct areas. Each area provides evidence to be incorporated into a cultural value constellation. The first section assesses the cultural value produced by the interaction between British Council accounts, project partners, and the users who engage with them via Twitter. The second section assesses the extent to which the British Council was able to drive cultural value by building connections across cultural and international boundaries and engage in the broader conversations which occur around the #SouthAsia hashtag.

The report concludes that the use of Twitter around **the South Asia Season achieved success at a tactical level** – in the sense of individual accounts fulfilling the daily tasks of producing content that reaches users and engages them. However, **opportunities exist to extend cultural value at the strategic level** by defining more clearly how British Council accounts operate *collectively* and the different roles they fulfil when engaging with Twitter users. A full list of the roles and discussion of their characteristics is presented in appendix 1.

Findings related to the South Asia Season:

- **During the South Asia Season British Council accounts were more successful at engaging Twitter users around issues of research, education and skills than other areas.** Twitter accounts which responded to the South Asia Season tweets tended to be focused on the sphere of research, education and skills. There were fewer tweets around the Arts, which perhaps was surprising as the season focused on the fields of education and culture.
- **Twitter interactions by British council accounts tended to be BC-centric and there is limited evidence of ‘conversations’ with non-BC accounts taking place.** Where British Council accounts retweeted or mentioned other Twitter accounts, these accounts were frequently other British Council accounts, belonging to specific projects (@HEGoingGlobal, @BritishArts, @UK_CE), individuals at the British Council (@JJBaybee, @TimRivera, @Nishatriaz), or partners such as the RSA (@theRSAorg), or The Royal Court Theatre

¹ Gem: Contemporary Jewellery and Gemstones from Afghanistan, British Council website, <http://design.britishcouncil.org/blog/2013/oct/01/gem-contemporary-jewellery-and-gemstones-afghanist/>

(@RoyalCourt). While using a range of accounts has the potential to reach different audiences, during the South Asia Season content sharing appears to have relied on tactical decisions being made by those responsible for individual accounts rather than based on a strategy for British Council accounts to deliver value collectively.

- **British Council tweets focused primarily on announcements and disseminating information about events.** As a result, tweets tended not to link events to the wider South Asia Season nor provide twitter users with a sense of ‘access’. This created two opportunities to extend cultural value.

First, the focus on specific events often meant tweets failed to reference the South Asia Season when promoting events which were part of the season. For example the main corporate account @BritishCouncil did not reference the ‘season’ aspect of the project when mentioning activities or events in #SouthAsia. This inhibited cross promotion between events and limited the potential reach and engagement the individual events could have achieved.

Second, with the focus on announcements, there was little opportunity for users to access greater levels of engagement. For example, using Twitter to disseminate information about an event does not give twitter ‘followers’ a sense of being able to have access to the content of that event. ‘Access’ in this context could be a preview, a virtual tour, a look behind the scenes or retweeting comments from speakers ahead of the event, among many other options, depending on the nature of the specific event. Finding ways to provide social media users with a greater degree of access creates the opportunity to drive cultural value through increasing the level of engagement with British Council content.

- **The British Council corporate account @BritishCouncil mentioned smaller BC accounts but did to amplify content from those accounts.** While @BritishCouncil mentioned other British Council accounts, these mentions could have amplified or aggregated that content to a greater extent if done as part of a broad strategy. This could be done by retweeting rather than mentioning an account and by adding context to that retweet, such as linking tweets about a specific event to other events that are also part of the South Asia Season. Producing a clear strategic vision of the different roles accounts are playing to deliver impact collectively, has the potential to convert the success of individual twitter accounts into greater cultural value for the British Council. Examples of the different roles are identified in body of the report and a list of potential roles, their value and characteristics are included in the Appendix 1.

Findings related to the wider 'Twittersphere' for #SouthAsia:

- **The British Council gathered greatest attention from content relating to skills and education in South Asia** The largest discussions around #SouthAsia, can be grouped into four topics we have called: skills for employment and education, environment, international relations, and women in South Asia. This indicates users recognise the British Council as particularly relevant to the development of skills, particularly in relation to employment, which fits with the logic and focus of many British Council activities.
- **The South Asia Season accounted for a small proportion of traffic for #SouthAsia.** This indicates the British Council successfully identified an active hashtag which was already used by individuals and organisations. This fits well with the stated aim of the season to facilitate links between those seeking to connect, create and collaborate. However it also indicates that there is an opportunity to increase the level of engagement with users already using #SouthAsia.
- **The World Bank was the most prominent organisation for #SouthAsia.** This is because many accounts retweet or mention @WorldBank, even though the World Bank does not actively engage with those following or retweeting their content. In this sense @WorldBank is acting as a content producer using social media to broadcast their messages. Identifying opportunities to retweet World Bank content may provide a means to engage with those users that are avid followers of the @WorldBank. For example, one of the most retweeted World Bank tweets in our data contained the same information as quoted on page 2 of the British Council South Asia Season brochure. This would have been an opportunity to deliver greater cultural value by making a connection between the World Bank identifying an issue and the British Council's work in responding to that challenge.
- **There was an opportunity to drive cultural value by facilitating the connection between online conversations, just as traditional cultural relations brings people together in the physical world.** Network analysis showed many discussions on Twitter occurred in separate small but parallel groups, rarely intersecting or interacting, even when interests overlapped. These conversations tended to take the form of a hub and spoke network, in the sense that groups tended to congregate around one of the prominent accounts in the network, interacting primarily with that central account rather than each other or other prominent accounts in parallel discussions. As a result the majority of Twitter users only interacted with one of the prominent organisations within #SouthAsia – for example the British Council, or the World Bank, but not both. As users tend to be in small isolated communities, there is an opportunity for the British Council to drive greater engagement by acting as a bridge to facilitate connections between those communities.

- **The cultural value which can be generated by facilitating connections between users is demonstrated, within our data, by The Sustainable Development Policy Institute (SDPI) in Pakistan.** SDPI was an especially active account which provoked more mentioning/retweeting/replying than the British Council. SDPI facilitated connections between diverse Twitter users, resulting in a complex and inclusive discussion between numerous accounts. An account run by the British Council which emulated this type of interaction could deliver higher engagement and cultural value.
- **No account performed as well as the British Council as both a curator and a content creator.** This means that within the #SouthAsia network the British Council was neither wholly a ‘creator’ of content (the World Bank model), nor only a ‘curator’ (like SDPI). Instead the @BritishCouncil account did some of each. While individual British Council accounts skilfully navigated a fine line tactically between promoting their own content and sharing or amplifying the content of others to deliver cultural value, British Council accounts did so within a small community of other British Council accounts and project partners rather than bridging between diverse communities. Clarity at a strategic level over which accounts were primarily creating content and which were acting as curator could create the potential to increase the breadth of users engaged by a future ‘season’.

Recommendations

Using this analysis the research identified a range of opportunities to drive greater cultural value through social media:

- There is an opportunity to derive greater cultural value, including elements such as reach, quality and engagement, by developing means through which social media can provide ‘access’ to British Council events. This may be attending physical events, or digital access to content produced, such as virtual tours of exhibitions, or audio and video of events.
- Greater clarity at a strategic level could allow The British Council social media accounts to work together more closely and collaborate more effectively to promote Seasons, projects and events. This would increase drivers of cultural value such as the reach of, and engagement with the content of a season as a whole. It would also provide a range of opportunities for users to engage with British Council accounts.
- A strategic decision to develop a range of accounts that adopt different methods of interacting with social media users would allow accounts to focus on different elements of cultural value. For example, accounts responsible for producing and distributing British Council content could focus on drivers such as utility, quality and reach while other accounts responsible for engaging with users and

facilitating connections or bridges between communities could focus on relevance, internationalism and elements of citizenship. In the latter case, British Council staff members on Twitter, such as @TimRivera, @NotMinogue, or @LakmaalR are well placed to make connections between the projects on which they work and wider social media content.

- If greater interaction or engagement is desired, connecting the events which make up a Season with issues that tend to provoke more involved discussions could promote greater engagement. For example, in the case of #SouthAsia, environmental issues stimulated discussion.
- Once particularly engaging issues have been identified, research into these pre-existing discussions, such as that around #SouthAsia, would help British Council accounts recognise and engage with key actors in those discussions. This would support the existing strategy of adopting #tags already actively used on social media platforms and drive elements of cultural value and cultural relations including the internationalism of creating connections across cultural and national borders.

Aims and Rationale

This research report analyses Twitter data relating to the British Council's South Asia Season, which ran from September to December 2013. The results presented in this report provide evidence to be incorporated into a cultural value constellation. The captured data includes tweets from a variety of accounts belonging to the British Council and their project partners, and also from engaged individuals and organisations. This report combines different modes of analysis (including network analysis, key actor analysis, role analysis and interest mapping) in order to add to the British Council's own data, specifically to understand:

- a) Who instigated and drove Twitter conversations.
- b) How Twitter conversations developed during the season.
- c) How the British Council's Twitter accounts operated in the network.
- d) Who was interacting with whom on the network, and what these patterns of interaction tell us about participation and engagement (participation/ engagement value).
- e) The scale, size and scope of Twitter conversation about the South Asia Season, and the allied impact of British Council activity on the 'twittersphere' across nations and languages (cosmopolitan value).
- f) The extent to which the British Council acted as 'creator' or 'curator' of tweeted content - promoting its own content or amplifying the perspectives of non-British Council accounts.
- g) The extent of overlap on social media between the South Asian Season and other international organisations' projects, and whether the overlap could be used to generate greater cultural value in future.
- h) What can be learned for future events, and what alternative strategies may be available for maximising the value of Twitter interactions.

Context - The South Asia Season

The British Council UK-South Asia season, was a programme over the autumn of 2013 to celebrate and explore the cultural relationship and connections between the UK and South Asia.² To fulfil this aim, the British Council sought to promote opportunities to connect, create and collaborate in the fields of education and culture between the UK and countries across the region, namely India, Sri Lanka, Pakistan, Afghanistan, Bangladesh, Nepal and Iran. This is in tune with the British Council's overall aim to create international opportunities, and build trust.

*'At a time of rapid progress and growing challenges, there is an increasing need for us to come together to foster an exchange of knowledge and ideas and develop opportunities for future collaboration.'*³

Examples of British Council content about the South Asia Season include the *South Asia Season Brochure*,⁴ and *Global Education Dialogues: The skills revolution in the UK and South Asia perspectives and challenges*.⁵

Methodology and Data

For the purpose of this study, an archive of tweets was created by Alex Voss at the University of St. Andrews. The initial dataset contained tweets which included any of the hashtags '#SouthAsia', '#EducateSAsia', and '#GoingGlobal' as well messages mentioning a range of British Council twitter accounts. Detailed criteria and volume measures for different terms are included in Appendix 2. To assess the cultural value the dataset was analysed both as a narrow social network of Twitter users tightly connected with the British Council, and as a wider network of users who posted about South Asia in general, thus making the analysis context-rich.

We initially looked at #EducateSAsia and #GoingGlobal. While these contain some interesting insights, these were found to be less focused on the South Asia Season and so

² Gem: Contemporary Jewellery and Gemstones from Afghanistan, British Council website,

<http://design.britishcouncil.org/blog/2013/oct/01/gem-contemporary-jewellery-and-gemstones-afghanist/>

³ South Asia Season, British Council website: <http://www.britishcouncil.org/organisation/press/south-asia-season>

⁴ South Asia Season Brochure: <https://uk2.live.solas.britishcouncil.net/sites/britishcouncil.uk2/files/south-asia-brochure.pdf>

⁵ Global Education Dialogues: <https://ihe.britishcouncil.org/events/global-education-dialogues-skills-revolution-uk-and-south-asia-perspectives-and-challenges>

for the subsequent majority of the analyses in this report we focus on #SouthAsia which captures the breadth British Council activities. Data for #EducateSAsia and #GoingGlobal are included in Appendix 2.

Aims and Types of Analysis:

- *'Volume of Activity'* analysis was used to count tweets and retweets for #SouthAsia, and when they happened. It also showed which accounts were frequently retweeted, or were frequently mentioned. This volume data informed our choice of subsequent analytical techniques.
- *'Network Analysis'* allowed us to investigate the scope of discussions, and understand any variation in their characteristics depending on whether they did or did not include British Council accounts. Equally, we could identify the largest group of users retweeting each other, known as a 'Giant component', and assess the characteristics which distinguish those users from users that only engage in much smaller groups.
- *'Key Actor Analysis'* was used to look at metrics relating to the most prominent accounts tweeting or mentioned in tweets about #SouthAsia. We observed individual British Council and non-British Council accounts, and then investigated whether there was a difference between their patterns of interaction.
- By combining the different analytical techniques we could then explore whether British Council accounts were acting as 'curators' of content from other Twitter users, or were focusing on amplifying British Council content.

Below we have provided some examples of our data and analyses that have informed the summary of findings above.

Section 1: Focus on the South Asia Season

This section focuses on the interactions with Twitter accounts operated by the British Council. From the data archive of all tweets which contained #SouthAsia between the 23rd September 2013 and 6th January 2014 we extracted those tweets which were a retweet / @mention of a British Council account or were a retweet / @mention by a British Council account.

Interaction Data:

The British Council adopted a strategy to inject British Council content into existing Twitter conversations via the hashtag #SouthAsia. As the graph below shows, this tag was in constant use during the period of the South Asia Season although on only two occasions in that period did tweets exceed 100 per day. This shows the British Council chose a tag which had an active community already using it, but not a community so big the British Council could not hope to have an impact.

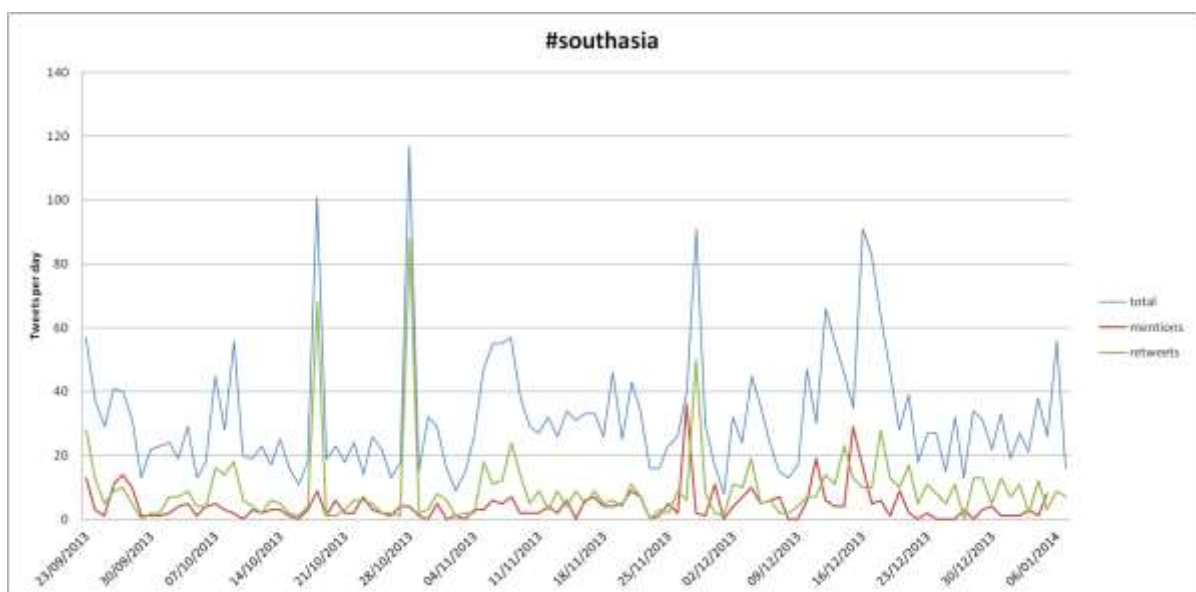


Figure 1. Volume of Tweets, Mentions and Retweets over time

The British Council, as well as partner organisations involved in the South Asia Season, participated in Twitter discussion via multiple accounts, thus creating opportunities for engaging wider Twitter audiences, and for collaboration. An overview of these accounts is presented below to show how the different accounts performed relative to each other. In the table, ‘in’ refers to the times a user mentioned or retweeted that account, while ‘out’ refers to the number of times the named account mentioned or retweeted others.

Account	Description	Tweets	Mentions		Retweets		Total ⁶	
			In ⁷	Out	In	Out	In	Out
BritishCouncil	BC Main Account	11	32	3	56	1	88	4
IkBritish	BC Regional	12	1	3	12	6	13	9
JJBaybee	BC Employee	10	2	9	9	3	11	12
theRSAorg	Project Partner	0	8	0	0	0	8	0
bdBritish	BC Regional	17	0	1	6	5	6	6
HEGoingGlobal	BC Project	11	0	5	5	0	6	5
IndiaAtLSE	Project Partner	1	5	0	0	1	5	1
TheEIU	REC-sphere Organisation	0	4	0	0	0	4	0
UK_CE	BC Project	2	1	0	3	1	4	1
ActiveCitizens	BC Project	13	0	10	4	0	4	10
dcfrombc	BC Employee	4	0	6	4	0	4	6
BritishArts	BC Project	7	0	0	3	3	3	3
SarahMacshane87	REC-Sphere Employee	3	0	0	3	1	3	1
MarkNowotny	CIVICUS Employee	0	3	0	0	0	3	0

Table 1. BC South Asia key accounts overview

The overview of the data which focuses on interactions with British Council operated accounts, shows that although @BritishCouncil did not tweet the most frequently about #SouthAsia it was by far the most retweeted and mentioned account. This one would expect from an account with vastly greater numbers of followers than many other British Council accounts, for example @BritishCouncil has over 105,000 followers, where as @IkBritish has slightly over 1,000 followers. This highlights the opportunity for @BritishCouncil to amplify the reach of accounts such as @IkBritish. However, these findings, particularly the low number of times accounts such as @bdBritish and @IkBritish used ‘#SouthAsia’ also suggest that the use of the tag by British Council accounts was intermittent, rather than a consistent practice.

⁶ Total = retweets + mentions + replies (replies are not given in the table, as respective numbers are insignificant compared to retweets and mentions)

⁷ In Table 1, “In” refers to incoming connections, i.e. number of times this account was retweeted/mentioned by others; “Out” refers to opposite respectively.

Having identified an existing tag with which to engage, greater value could have been created if the tags were used consistently to provide a means to connect together all the events within the season. To give greater context to table 1, and assess whether each account is engaging different users or if British Council accounts are retweeting each other we produced a network representation of the interactions which included British Council accounts. This representation is shown in Figure 2, with each circle representing a different Twitter account.

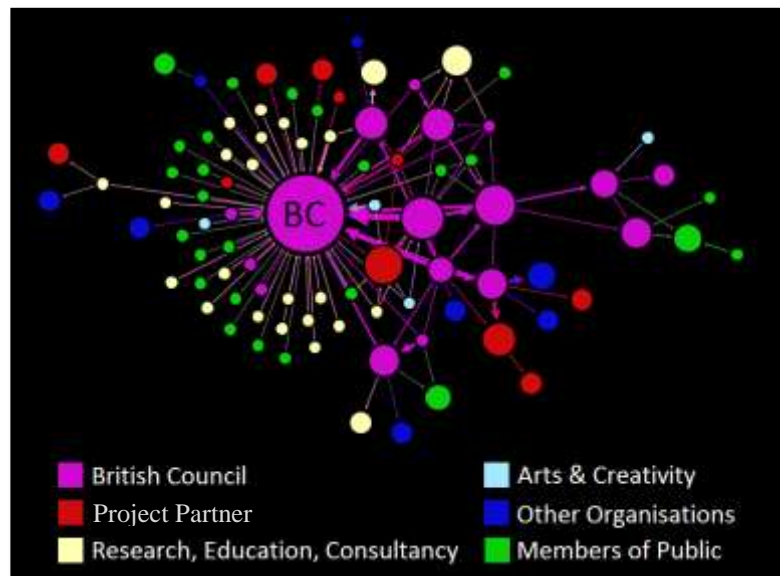


Figure 2 BC South Asia discussion graph

Bigger circles represent those accounts retweeted or mentioned more frequently in our data. The colour of the circles represents the broad category we assigned to that account based on the information in their user profile. This provides an overview of the accounts that are engaging with the British Council. Arrows run from the account producing a tweet to the account mentioned or retweeted in that tweet. Reflecting the data in table 1 the corporate account @BritishCouncil is represented by the largest circle, labelled 'BC'.

Figure 2 demonstrates that Twitter activity was centred on the @BritishCouncil account, as this British Council account was retweeted and mentioned the most by other British Council accounts, members of the public, and organisations not involved in the South Asia Season.

The graph also shows that other BC accounts, for example representing projects (@HEGoingGlobal, @BritishArts, @UK_CE) or individuals (@JJBaybee, @TimRivera, @Nishatriaz), mainly communicated with each other and with project partners. This is indicated on the graph by the larger arrows running between the pink circles.

Content of Tweets:

Analysing the content of tweets archived, we did not find the word ‘season’ in British Council tweets which also contained the hashtag #SouthAsia. There were several tweets about specific South Asia Season events, for example encouraging users to watch their live-streams. However, such tweets did not indicate that those events were parts of the bigger South Asia Season⁸. Hence the ‘Season’ as a whole was not promoted as the individual tweets about events were not linked together.

In addition, while some tweets contained hyperlinks to webpages which described South Asia Season events, the text of the tweets consisted of general information rather than an indication the linked content was specifically about the South Asia Season. Thus, the promotional effect was restricted only to those Twitter users who actually clicked on a hyperlink.

Creating a more easily identifiable connection between the events which comprise a season would create the potential to increase the reach and engagement of events, thus driving cultural value.

Delivering value through a sustained level of engagement requires consistent use of the same #tag, but equally requires accounts to capitalise on initial interest and interactions. For example, after British Council accounts and project partners, the next most active category was what we termed research, education and consultancy (abbreviated here to REC). This category contains accounts from other organisations which provide education, including language schools, or training around specific skills either as a commercial service or as part of international development programs.

Accounts in the REC category retweeted or mentioned the British Council, but there was rarely any reciprocal interaction from the BC. This indicates that the British Council was acting as a content producer, which others would pass on. However, this did not build into a sustained interaction either because the accounts did not see anything else of interest or because that initial interaction was not followed up by the British Council.

While maintaining a sustained interaction may not be the role of @BritishCouncil, there is opportunity to extend the cultural value of a season by developing a strategic approach in which there are different twitter accounts each of which has a range of roles, including sustaining interaction with users who are initially reached by @BritishCouncil.

⁸ The word “Season” was not even mentioned in the *BritishCouncil’s* tweets in the dataset we had obtained.

Section 2: The wider 'Twittersphere' for #SouthAsia.

Interaction Data:

This section extends the analyses, and places the Twitter activity for the South Asia Season in the context of wider activity around #SouthAsia.

This diagram represents all the interactions (retweets and mentions) which occurred using the hashtag #SouthAsia between 23rd September 2013 and 6th January 2014. The network identified in section one, (Figure 2) which showed the activity based around British Council accounts, is highlighted in purple as a sub-network of this larger network (Figure 3).

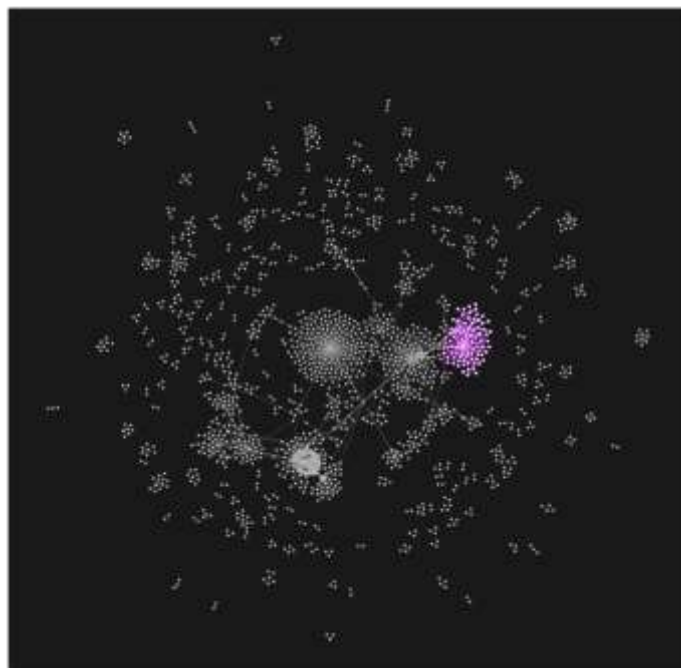


Figure 3: Network representation of interactions using #SouthAsia

Figure 3 shows that the network around British Council accounts is one of the larger sub-networks, but that most Twitter users discussing #SouthAsia are not engaging with the network around the British Council accounts. That there are also other sub-groups interacting around #SouthAsia may be because they do not want to engage with the prominent organisations in those groups, or because they were interested in specific topics but their existence highlights the opportunity for the British Council to facilitate connections, where appropriate, between these discussions. There are numerous parallel discussions about #SouthAsia rather than one interconnected 'conversation'. The largest loosely connected collection of discussions is highlighted in the graph below (figure 4).

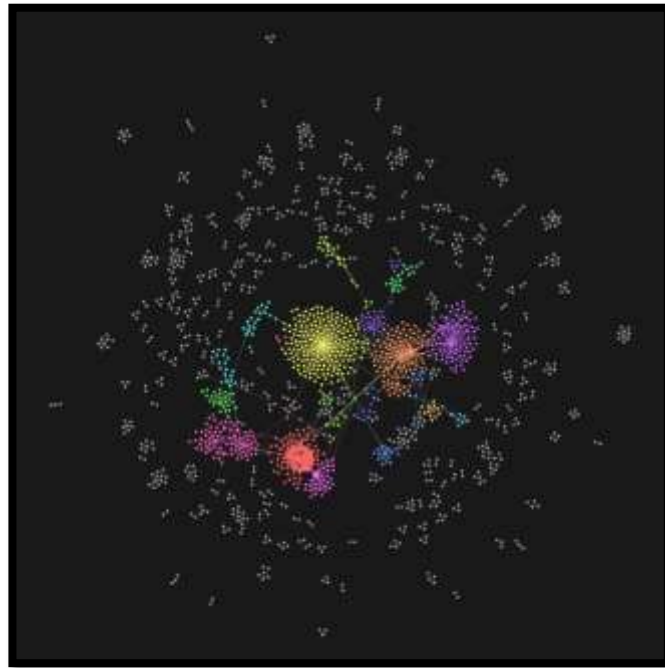


Figure 4: Network representation of interactions using #SouthAsia giant component highlighted

To understand the nature of these sub-groups and the opportunity to drive cultural value by facilitating connection between them, the following analysis focuses on the largest interconnected part of the network. This group is called **the giant component** of this social network. The giant component is the focus of subsequent analysis as there are already loose connections between the sub-groups, suggesting the potential for some degree of shared interest. To understand the composition and interests of these groups the following analysis identifies the prominent users in the giant component and includes a broad categorisation of the topic of discussion to map the interests of sub-groups.

To understand the prominent accounts within the giant component, figure 5 shows the accounts which were most frequently retweeted or @mentioned within our data.

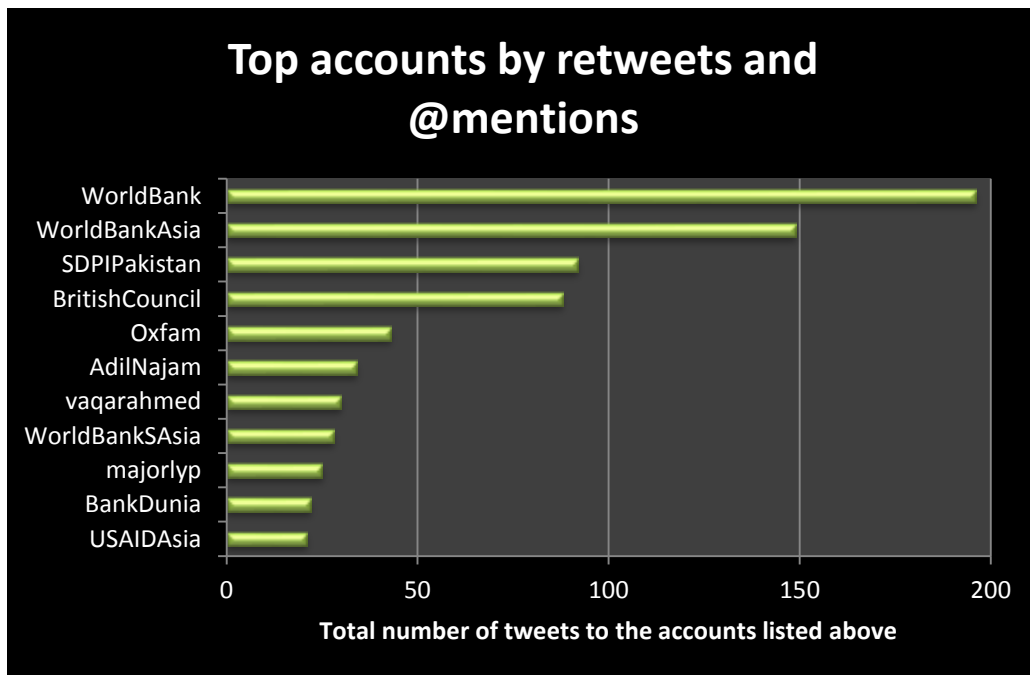


Figure 5. Twitter accounts with those who were most retweeted, mentioned and replied to

The World Bank is by far the most prominent organisation, as two of its accounts @WorldBank and @WorldBankAsia are the top two accounts in terms of retweets / mentions received in our dataset, while a third account @WorldBankSAsia is 8th highest.

To add greater context to the number of Retweets and mentions, the graph below (figure 6) shows a representation of the network of interactions between Twitter accounts which comprise the giant component. This allows the relationship between the prominent twitter accounts to be assessed.

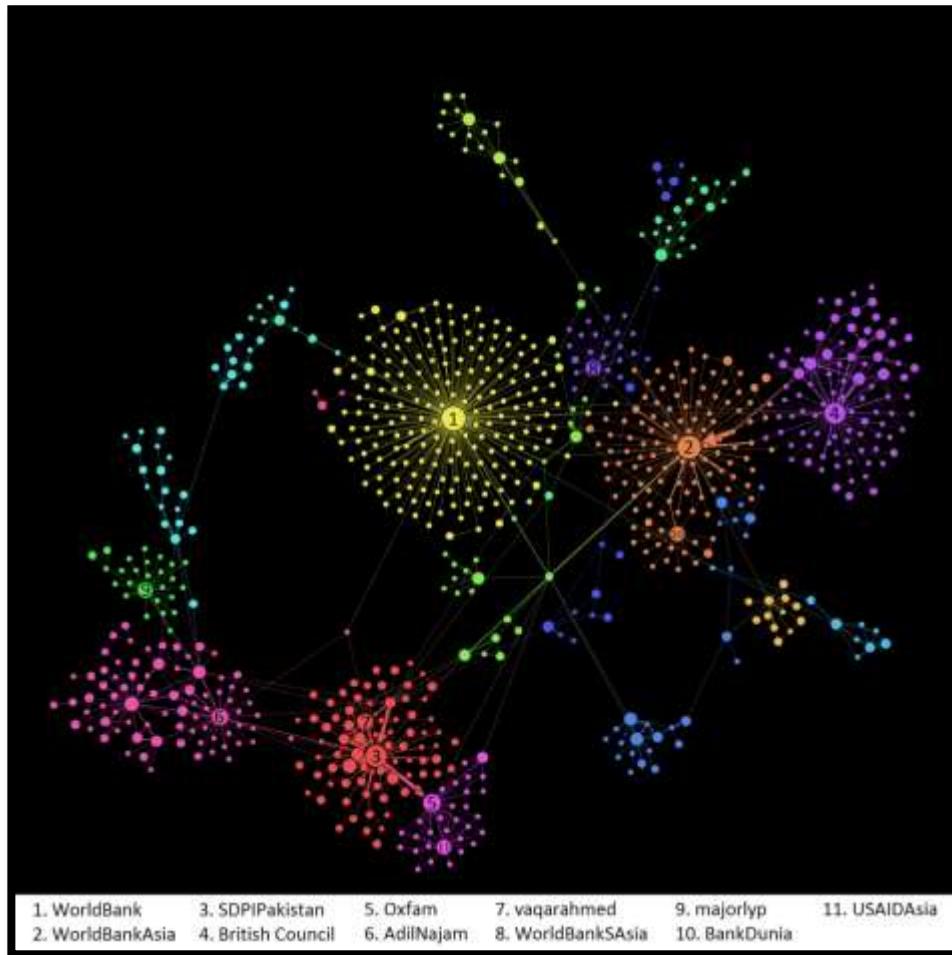


Figure 6. Giant component graph

In this figure the size of a node (which represents a twitter user), indicates the number of times a user is replied to, retweeted and mentioned by others. User accounts with the most retweets or mentions are labelled. We see from figure 6, that there is little interaction between the prominent accounts, providing strong evidence of networks existing in parallel rather than engaged in multi-directional interaction.

To investigate this phenomenon further we used an algorithm which calculated whether the network could be broken down statistically into smaller sub-networks or ‘clusters’.⁹ The sub-networks which could be identified were assigned different colours on the graph above and users tweeting to more than one large node were identified. For example, only two accounts tweeted to both *BritishCouncil* and *WorldBank*¹⁰, and only three accounts tweeted to both *BritishCouncil* and *WorldBankAsia*¹¹. This emphasises that despite using

⁹ Group identification was done using the ‘modularity’ algorithm in Gephi, based on Vincent D. Blondel, Jean-Loup Guillaume, Renaud Lambiotte, Etienne Lefebvre - Fast unfolding of communities in large networks (2008) <http://lanl.arxiv.org/abs/0803.0476>

¹⁰ *Vporia* and *TRIPATHYAJAY*

¹¹ *Effdebate*, *KosherStories* and *unwomenindia*

the same hashtag, interactions with the British Council actually occurred almost entirely in parallel to those with, for example, the World Bank.

An account which demonstrates how a user can facilitate connections between parallel discussions is The Sustainable Development Policy Institute (SDPI) in Pakistan. SDPI ranks above the British Council in terms of mentions and the network analysis shows SDPI were tweeting in a way which actively drew others into a conversation. Along with original content SDPI was aggregating content from elsewhere, mentioning other users and facilitating connection between Twitter users. This is represented in figure 6 as the red cluster which appears more ‘messy’ than the clear hub and spoke shape around @Worldbank (labelled number 1 on figure 6) or @BritishCouncil (labelled number 4 on figure 6). In addition, the more facilitative approach creates greater connection with other prominent users including @Oxfam, @AdilNajam, a blogger “Dr Majorly PhD”(sic) who writes the blog “Goat Droppings of Wisdom” and @vaqarahmed, currently deputy executive director at SDPI and formerly adviser [@UNDP](#).

Observation:

The association of the South Asia Season with the pre-existing hashtag #SouthAsia was a conscious attempt to interest users who were already engaging in interactions around similar issues. However, **the evidence shows that this aspiration of wider connection did not play out in practice as discussions took place in parallel.**

The following sections examine the opportunities to realise greater cultural value in future seasons by identifying the thematic focus of these parallel discussions and the role of key actors interacting on Twitter through the hashtag #SouthAsia

Map of Interests

This section examines the thematic content of the interactions in the prominent sub-networks identified by the network analysis to show the themes around which the British Council successfully engaged users. It will also show the themes through which there were opportunities to reach other groups of users and facilitate connections between the different sub-groups.

To provide an overview of the themes we created four categories: **Skills and workforce, Environment, International relations, and Women in South Asia.** These categories

were created after reviewing tweets from the accounts most frequently retweeted, mentioned or replied to in each sub-group. Subsequently the sub-groups were assigned to one of the categories if, after reviewing the tweets from users which made up that group, the tweets focused on one of the four areas. Figure 7 identifies the sub-groups on the network graph and table 2 maps the interests of each sub-group. This is brought together in figure 8 which shows which sub-groups shared similar themes.

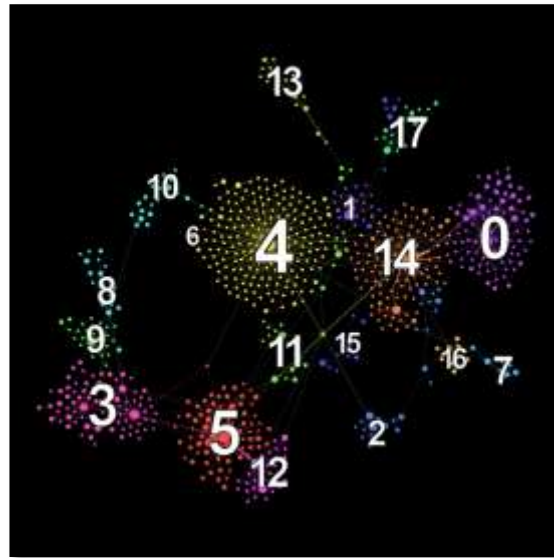


Figure 7. Sub-groups identified by number – for analysis in table 2

#	Prominent account in sub-network	Key topics	Broad theme of sub-network	Example tweet
0	BritishCouncil	Skills, workforce, education	Skills and workforce	Discussions on skills and education in the UK and #SouthAsia are being streamed live: http://t.co/u9pHB43ILm Take part: #EducateSAsia
1	WorldBankSAsia	Poverty, economic growth	Other socioeconomic	#Southasia must return to 8% growth a year so it can significantly reduce #poverty
2	UNEP_enlighten, UNEP	Energy efficiency, efficient lightning	Environment	Panel presentation at the @UNEP_enlighten #SouthAsia workshop featuring #BEE #BIS #EESL #CPCB http://t.co/QmEPcprhNv

3	AdilNajam	Environment, climate change, sustainability	Environment	Presented keynote at #SANDEE wrkshop on #ClimateChange #Development & #Security in #SouthAsia. http://t.co/sa0ttly6sd http://t.co/A5utTr87q1
4	WorldBank	Skills, workforce, general	Skills and workforce	In next 20 yrs #SouthAsia countries will add 1 million new people to the global labor force every month. http://t.co/24JmWTxdNt
5	SDPIPakistan	Climate change, environmental issues	Environment	Addressing mounting #climatechange effects stressed by #southasia parliamentarians http://t.co/Y9xmzZDxm4 @SDPIPakistan @pakobserver
6	ILRI	Sustainable use of livestock	Environment	De-risking aquaculture value chain investments in Bangladesh http://t.co/2XsumEpg72 #southasia #bangladesh #worldfish #crp37 #fish
7	IDSASouthAsia	Cross-country relations in the region (India-centric)	International relations	RT @ISN_Zurich: Coming up soon: @IDSASouthAsia's 7th #SouthAsia conference explores the role of perceptions in South Asian politics http://t.co/vB1
8	mughalbha	India-Pakistan relations	International relations	A century of war 1914-2014: War http://t.co/9PVeasfLjv War & conflict in #Urduliterature #Pakistan #India #SouthAsia
9	majorlyp	South Asia in space	Other	South Asia storms into space with successful launch of orbiter to Mars!! Proud day today. #Mars #SouthAsia
10	world_midwives	Newborn death, prematurity	Other socioeconomic	More than 75% of global newborn deaths occur in #SouthAsia and sub-Saharan #Africa where also #midwives lack #worldprematurityday
11	dwatchnews, WSPWorldBank	Sanitation, general	Other socioeconomic	[blog] Why #sanitation doesn't work unless the entire village buys in http://t.co/w18UfkNREZ #toilets4all

				#globaldev #SouthAsia
12	Oxfam	Sex-selective abortion, women rights, gender inequality	Women in South Asia	RT @USAIDAsia: Fact: @Oxfam estimates there are 50 million fewer women in #SouthAsia today due to sex-selective abortion violence neglect
13	State_SCA	US Foreign Policy, USA-SA relations	International relations	A/S Biswal briefing @ForeignPressCtr on #foreignpolicy in #SouthAsia and #CentralAsia. Transcript coming soon! http://t.co/d7TFsXVL2r
14	WorldBankAsia	Women rights, poverty	Women in South Asia	A portrait of empowered #women in #SouthAsia: lessons for #Indonesia: http://t.co/MQFi4K8Ya #gender
15	ForeignPolicy	Not clear	Other	Regarding #RTAs- first thing #SouthAsia needs to do is integrate its textile economies @AsiaBriefing @Diplomat_APAC #ManipalDialogue
16	storysouthasia	General	Other	Top 10 South Asia Stories of 2013 http://t.co/MP1TxWuFWr via @CFR_org
17	barbaraslavin1	Iran- and Afghanistan-centric	Other	for farsi speakers interview on #iran #afghanistan and #southasia http://t.co/qpltc8WHiL

Table 2. Thematic interest of sub-groups

As it can be seen, most sub-groups fall into one of the four thematic groups: Skills and workforce, Environment, International relations, and Women in South Asia. Figure 8 uses colour-coding to represent how these aggregated topics are spread in the network.

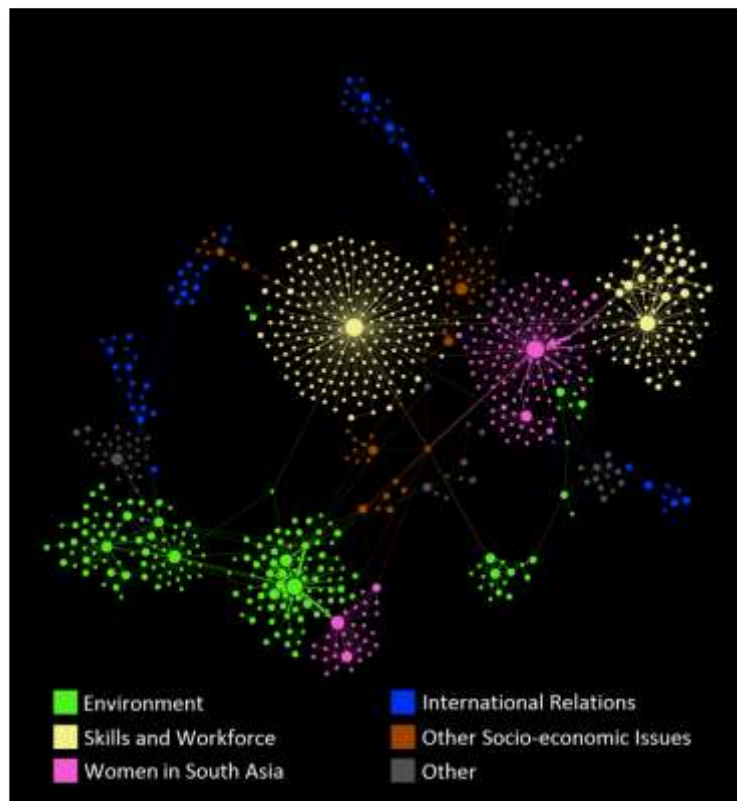


Figure 8. Sub-groups coloured by theme

That there are a number of clusters with the same colour demonstrates that having a shared thematic interest and using the same hashtag does not necessarily lead Twitter users to interact with other users that shared similar interests. The theme in which users were most frequently interacting was the topic of the South Asian environment due in part to the activity of SDPI. While the British Council was a driver of Twitter discussion about education and skills for employment in South Asia there was another sub-group with a similar interest that chose to engage with the World Bank rather than British Council. For example, during the period of data collection the British Council and World Bank were actually talking about the same data.



Figure 9: World Bank Tweet linking to a World Bank blog post¹²

¹² Abhilaksh Likhi, Employment and Participation in South Asia: Challenges for Productive Absorption, 24th October 2013. http://blogs.worldbank.org/publicsphere/employment-and-participation-south-asia-challenges-productive-absorption?cid=EXT_TWBN_D_EXT

One of the most retweeted tweets in our data was a World Bank tweet (figure 9) which contained the same information as quoted on page 2 of the British Council South Asia Season brochure.¹³ Identifying opportunities such as this to connect the two sub-groups creates the potential to increase the reach of British Council content as well as a likely increase in the level of engagement and cultural value.

Observations:

Analysis of the map of interests shows the following:

- British Council tweets using this hashtag did *not* focus on the South Asia Season. Instead tweets using the hashtag provided general information about education and skills for employment. Dispersed within these tweets, were occasional mentions of distinct events related to the South Asia Season. This is consistent with the observations from Section 1 and shows there were further opportunities for the British Council to use twitter to connect events together to increase the collective impact of the events which comprised the South Asia Season.
- Sub-networks of #SouthAsia, with a complex structure and multi-directional interaction between members, are mainly focused on the environment. The two biggest of these sub-groups are tightly interconnected with each other and include the account SDPI.
- These two observations suggest that there was an opportunity for the British Council to make a strategic decision to facilitate connection between different sub-groups, perhaps most easily with the users retweeting @WorldBank. This would require at least one British Council account to adopt a different method of interaction with users, demonstrated in this example by the account run by SDPI.

Key Actors Analysis

The opportunity to bridge between communities, facilitate connections and extend the cultural value of British Council content relies on using accounts that are able to engage with other prominent accounts as well as reach wider audiences. The key actor analysis identifies the users who fulfil these different functions in the #SouthAsia network. This analysis adds further evidence which highlights the opportunity to mandate some

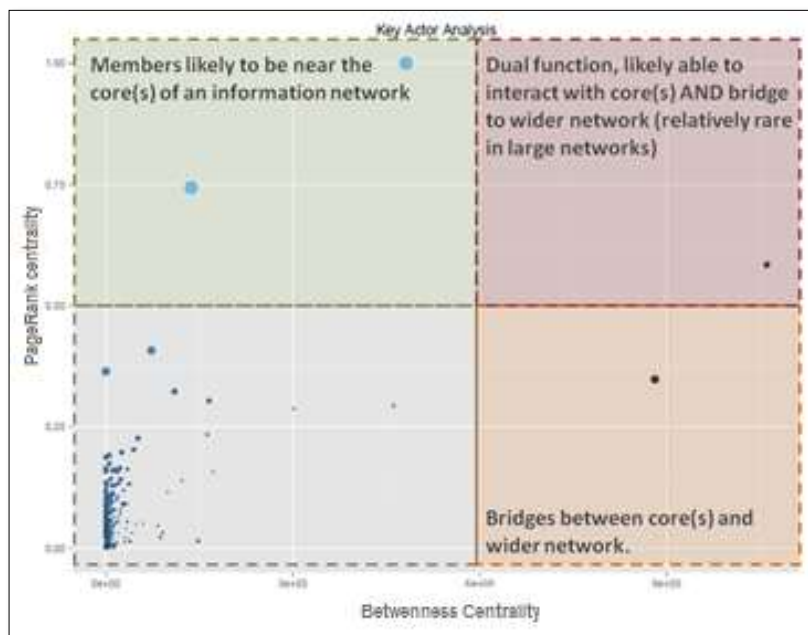
¹³ South Asia Season Brochure, British Council 2013:
<http://www.britishcouncil.org/sites/britishcouncil.uk2/files/south-asia-season-brochure.pdf>

accounts to be content producers promoting British Council activity and others to actively reach out to other communities.

The Data:

‘Key actors’ are the Twitter accounts which are pivotal in networks of tweets and retweets. We used a process of plotting two network metrics - ‘Betweenness’ and ‘PageRank’ - against each other to understand whether there was a difference in the role and value of different types of account. In broad terms ‘Betweenness’ represents how important a user is in facilitating the flow of information to specific parts of the network. Individuals fulfilling this role are often known as ‘bridges’ or ‘gatekeepers’ and are valuable as they tailor information to users in a specific part of the network. Those with a high ‘PageRank’ score are often key members of the network because other important network members interact with them. These users are heavily invested in the activity of that network and are usually recognised as important players by other members. Their value is in being a trusted source of information, often because they have privileged access to the information or to the other individuals at the core of the network. Detailed descriptions of these metrics, and their calculation, are discussed in the Appendix 5 and the methodology for Key Actor Analysis is presented in Appendix 6.

Each region highlights the key actors that fulfil different roles. The diagram below shows the significance of regions of the graph within ‘Key Actor Analysis’.



- Users in the bottom left quadrant tend to have no particular role and can be thought of as general users.

- Those in the top left tend to be in the core (or one of the cores) of the network. This indicates they are often those most involved and are likely to provide value by providing access to privileged information. They are likely to be driving discussion and valued as trusted sources of information which others share.
- Those in the bottom right quadrant fulfil the role of bridging between the core content producers and a specific community (or ‘audience’). The value of this role often comes from tailoring information to that ‘audience’ and as such these users are more valuable to that group but less important to everyone else. Their value is that they often also share content from other sources in addition to their own tweets.
- Users in the top right are rare. They have a dual function, as they have the same trusted status as those in the top left quadrant. They also fulfil the same ‘bridge’ role as users in the bottom right quadrant, reaching areas of the network which others do not.

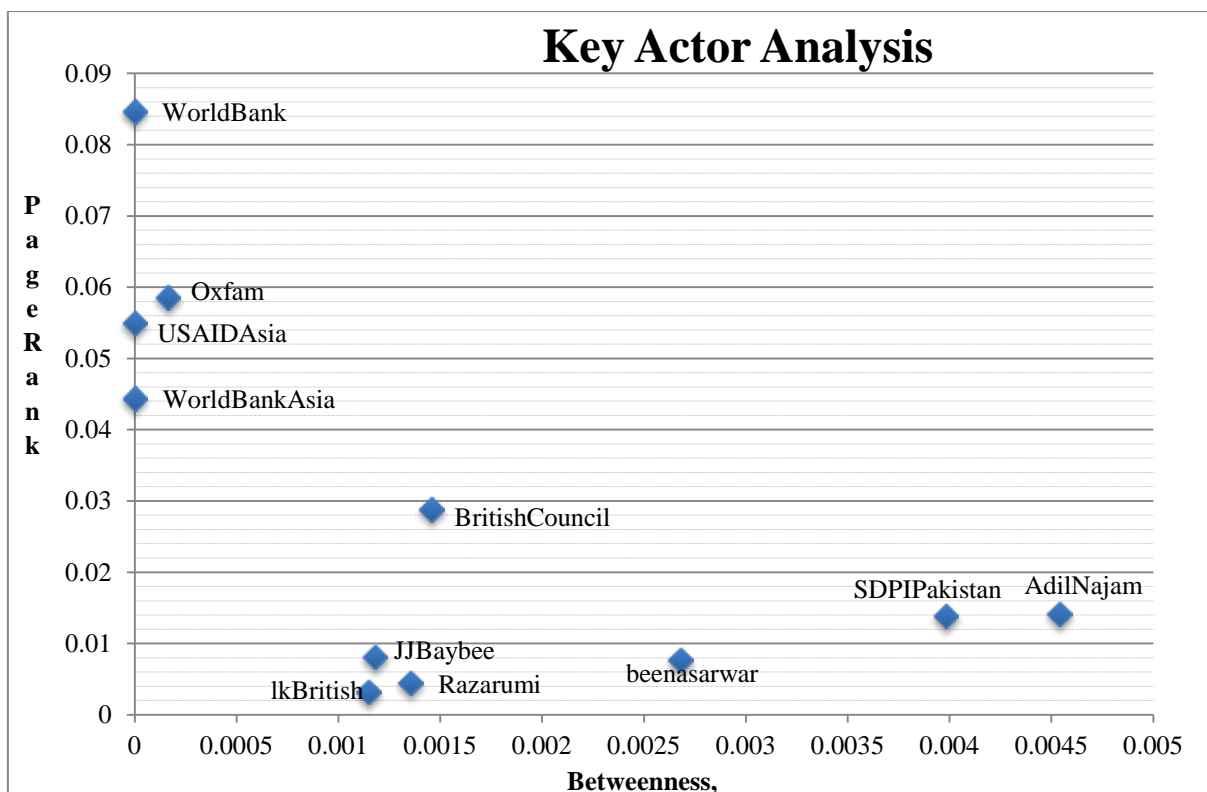


Figure 1. Key actors of the #SouthAsia network

This diagram provides some interesting insights about the position of prominent accounts in the network. Firstly it shows @BritishCouncil does not score highly in either metric. The @WorldBank has the highest PageRank and zero betweenness –

indicating that it has been successful in ‘broadcasting’ content that is respected by others. The accounts with the highest betweenness scores, denoting they are adopting ‘bridging’ role, are *AdilNajam* and *SDPIPakistan*, which was identified earlier. This is because, unlike the World Bank, these accounts are actively mentioning and retweeting other accounts as well as producing their own content.

However, while there are accounts that score higher than the British Council on an individual metric, there are no accounts scoring more than *@BritishCouncil* in both centrality metrics simultaneously. As a result, it is the only account to combine reasonable scores for Pagerank and Betweenness. This means that *@BritishCouncil* has a unique role in the network as it is reaching users that other accounts do not reach (high Betweenness) and is an account at the core of a particular sub-group in the network (high Pagerank).

In addition, two other British Council accounts appear as key actors in the network, *lkBritish* (the British Council Sri-Lanka) and *JJBaybee* (Zohare Haider, Regional Head of Digital at British Council). These accounts are fulfilling a similar if smaller scale of the ‘bridging’ role played by *SDPIPakistan* or *AdilNajam*. The value of these accounts is the ability to reach a specific audience which *@BritishCouncil* cannot. This is either by tailoring content to make it relevant to a specific community or by actively aggregating content around a specific issue to become a source of information that a particular community values.

Observations:

These findings demonstrate that success on Twitter can come in different forms, from producing highly respected content, such as the *@WorldBank*, to actively engaging with users, such as *@SDPIPakistan*. This demonstrates that it is possible for different accounts can derive qualitatively different cultural value depending on those roles.

In the context of *#SouthAsia* and the South Asia Season British Council accounts have performed a range of roles simultaneously and perform well at a tactical level. To increase the cultural value from future seasons, the British Council could consider mandating accounts to focus on specific roles, for example deepening the value of longer term engagement, while accounts, could focus on extending reach. This would

allow accounts fulfilling different roles to collaborate and deliver cultural value collectively, for example by taking opportunities to bridge between communities.

In addition, conducting a key actor analysis to find users with high Betweenness in social media networks, can facilitate the wider dissemination of British Council content to specific communities. Finally, inviting individuals or organisations with accounts that show high Pagerank to events tied to a Season might facilitate the creation of greater cultural value. The range of different roles and their different characteristics set out in the appendix 1.

Conclusion

The report has shown that the use of Twitter around **the South Asia Season achieved success at a tactical level** – in the sense of individual accounts fulfilling the daily tasks of producing content that reaches users and engages them. However, **opportunities exist to extend cultural value at the strategic level** by defining more clearly how British Council accounts operate *collectively* and the different roles they fulfil when engaging with Twitter users. A full list of the roles and discussion of their characteristics is presented in appendix 1.

The level of activity around South Asia Season was, by measures of the network as a whole, moderate at best. However, when the analysis is narrowed to discussions on the topic of skills and employment in South Asia, the British Council performance appears stronger. Ultimately, strategic clarity about the different roles that various British Council accounts are mandated to fulfil could allow accounts to deliver value *collectively*.

The British Council succeeded in engaging Twitter users around the South Asia Season particularly with content focused on research and education. There were fewer tweets around the Arts, which perhaps was surprising as the season focused on the fields of education and culture. Analysis of the hashtag #SouthAsia indicates that if greater interaction or engagement is desired, connecting the events which make up a Season with issues that tend to provoke more involved discussions could promote greater engagement. For example, in the case of broader discussion around #SouthAsia environmental issues stimulated greater discussion.

To engage users the British Council used a range of accounts including; corporate accounts such as @BritishCouncil, projects such as @BritishArts and @HEGoingGlobal, regional accounts such as @BDBritish and @IKBritish representing offices in Bangladesh and Sri Lanka, and the accounts of individual British Council employees such as @JJBaybee, @TimRivera and @Nishatriaz.

Many of the interactions around the South Asia Season were British Council-centric. Interactions frequently took place with other British Council accounts, for

example those representing specific projects (@HEGoingGlobal, @UK_CE), individuals at the British Council (@JJBaybee, @TimRivera, @Nishatriaz), or partners such as the RSA (@theRSAorg), or The Royal Court Theatre (@RoyalCourt). In comparison, there was limited evidence of ‘conversations’ taking place with accounts that were not already part of the season or the British Council.

When using the tag #SouthAsia, the British Council Twitter accounts focused on promoting specific events rather than connecting that event to the wider season. As a result, British Council accounts often failed to reference or connect the individual events to the South Asia Season. For example the main corporate account @BritishCouncil did not reference the ‘season’ aspect of the project when mentioning activities or events in #SouthAsia. This inhibited cross promotion between events that were part of the season. Also, while @BritishCouncil did mention some smaller British Council accounts, it did not amplify or aggregate their content in a way that promoted the South Asia Season as a whole.

In addition to connecting events to the wider season, there is an opportunity to derive greater cultural value, including elements such as reach, quality and engagement, by developing means through which social media can provide ‘access’ to British Council events. During the South Asia Season, the British Council used Twitter to share information make announcements and promoting the live-streams of events, but this could be extended, for example allowing users to attend physical events, or digital access to content produced, such as virtual tours of exhibitions, or audio and video of events.

The South Asia Season accounted for a small proportion of traffic around #SouthAsia. This indicates the British Council successfully identified an active hashtag which was already used by individuals and organisations. However, network analysis showed that discussions using #SouthAsia on Twitter tended to take place in separate small but parallel groups. These groups rarely interacted with each other even when interests overlapped. Members of one group tended to congregate around the prominent account in that group, interacting primarily with that central account rather than each

other, creating a hub and spoke model of interaction. Orbiting around these prominent accounts, users rarely engage with each other or with users from other groups.

The data on #SouthAsia demonstrates the value of mandating accounts to adopt different roles around a season. For example, some accounts could have adopted a mode of interaction similar to that demonstrated by the Sustainable Development Policy Institute (SDPI) in Pakistan. The SDPI was valuable to users because it facilitating connections between diverse Twitter users, resulting in a complex and inclusive discussion between numerous accounts. It demonstrates the cultural value which can be created by a social media account which curates content and ‘bridges’ between users or communities.

To drive greater cultural value British Council accounts could seek to bridge between these separate discussions. This would be in line with the stated aim of the season to facilitate links between those seeking to connect, create and collaborate. In future, research into discussions around pre-existing #tags could identify key actors who are already prominent and who could be engaged to increase the reach of British Council content.

Appendices

Appendix 1: Roles within networks, and their potential values

In our suggestions for further research we identified that strategies for maximising cultural value based on developing specific roles within the network and sub-networks may be useful. To that end we have teased out the different roles seen in the 100 Women Twitter networks.

The Broadcaster:

Core accounts focusing on producing original tweets, retweeting / amplifying other BBC accounts. The primary value of this role is maximising reach, and of disseminating content that emphasises the core cultural values of the BBC – trust, reliability etc. Because of this content must be tightly managed.

The Bridge:

These accounts seek to reach specific groups ('audiences') either through translation or tailoring of content to the specific tone or interest. These Bridge accounts may already have an existing relationship with the specific community. Their value is from the ability to reach and engage specific groups not reached by the broadcaster accounts.

The Curator:

Accounts responsible for aggregating and filtering content to produce a rich and diverse stream.

- A conservative approach to the role of curator draws external content into a BBC broadcast, thus maintaining high levels of control and protection of core BBC cultural values. Examples include the journalist account BBCRosAtkins, or the corporate accounts BBC_WHYS or BBC Outside Source, that function to gather content to shape the agenda for a specific news program
- A social approach to the role of curator is more ambitious. It would use the expertise of BBC journalists to aggregate content, embedding the BBC within a

culture of ‘social search’ (finding news through trusted relationships and connections), and drawing on the insight and expertise of many individuals and organisations on Twitter. These users have the potential to enrich the BBC broadcast approach, and to also act as conduits which may extend the BBC’s reach. This social approach to the curator role would need clear branding and attentive management but the rewards are high cultural value in terms of participation and engagement, and also for the journalists themselves in terms of understanding their audience and accessing new sources of content for their own reporting.

The Broker:

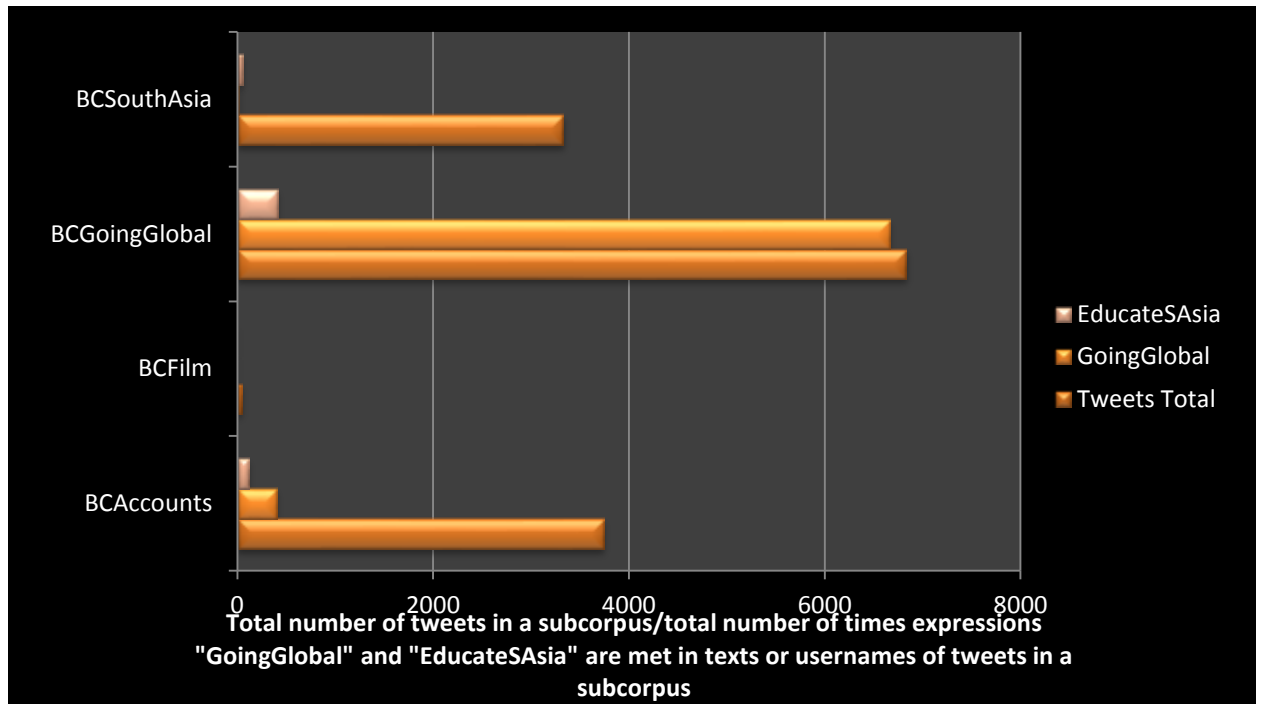
Broker accounts also create value by accessing hard to reach groups. However, the Broker role is fulfilled by non-BBC accounts retweeting BBC content to their pre-existing network. That content must have a value both to the Broker themselves, and to their network. Potential Brokers could be given early warning, or actively made aware of content which may be of interest. This approach is likely to be most effective where potential Brokers are more invested in an issue than the BBC, and where they are not ‘crowded out’ by the BBC acting as Broadcaster.

The Facilitator:

A facilitative BBC account would provide access to larger audiences for non-BBC accounts that have strong content but a small number of followers. This is a contemporary re-imagining of one of the initial functions of the BBC World Service. In the #100women season BBCWorld amplified other BBC accounts, but not tweets from the 100 women themselves. It can be assumed the 100 women had things to say which were worth hearing and BBCWorld, BBCNews, and BBCAfrica had large networks of engaged users receptive to new content. Cultural value could have been enhanced for all parties by facilitating the connection between these users and networks. If a greater level of active empowerment of users is desired, then facilitation offers high returns in cultural value for moderate investment.

Appendix 2: Tweets Selection Criteria

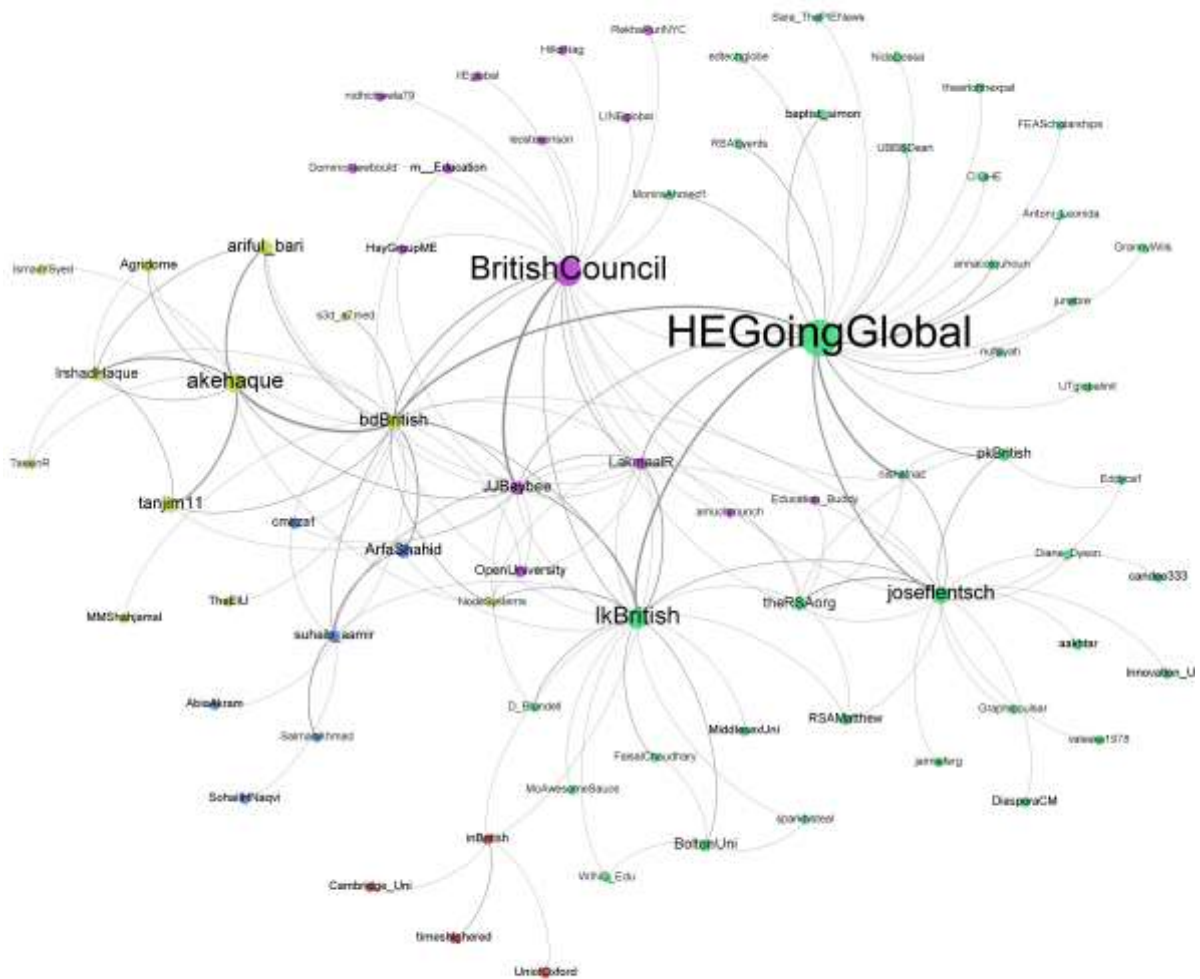
Tweets are posted between Sept 23rd 2013 and Jan 7th 2014. Tweets contain “SouthAsia” (without space) either as a hashtag, i.e. with hash key (#) in the beginning, or as a word, i.e. without hash key. The BC also used alternative hashtags #EducateSAsia and #GoingGlobal. Bar Chart 1 represents the amount of tweets containing these key words in different corpora of collected data (see Appendix 7 for details):



- Bar Chart 1. Total number of tweets and total number of times expressions "GoingGlobal" and "EducateSAsia" appear in texts or usernames of tweets in four data sets we collected: "BCSouthAsia", "BCGoingGlobal", "BCFilm", "BCAccounts"

This graph shows that the hashtag “EducateSAsia” played minor role in tweeting about South Asia Season. “GoingGlobal” hashtag is not frequently mentioned in tweets directly related to the topic of South Asia; however there is a distinct class of tweets with this hashtag which can be briefly analysed separately from the main dataset. For this reason we focus on #SouthAsia in the body of the report.

The network graph showing the retweets and mentions in tweets that also contained #EducateSAsia is shown below. It shows the network is, as one would expect, smaller than for #SouthAsia as only 76 users appear in the network.



The British Council accounts are prominent within this information sharing network. The two non-BC accounts which are prominent are @akehaque, A.K. Enamul Haque an academic whose research focuses on Bangladesh and @joseflentsch ex-International Director of the RSA.

Appendix 3: Data Limitation for Reply Representation

The data collected for this analysis can limit representation of direct replies, as within a reply there is a high probability that user does not use a hashtag: if it is already in the original message to which reply goes, and if replies are seen just as a part of a conversation (not as messages on their own), posting this hashtag again seems unnecessary.

However, the data in this dataset is hashtag-based collected, so some of the replies can be automatically excluded from the dataset.

Appendix 4: Detailed graphs for Replies, Retweets and Mentions

As it has been said above, every edge represents a retweet, a mention or a reply, so these three ways of users' communication on Twitter are not distinguished from one another. The following figures try to distinguish them by showing those edges which represent only replies (see Figure 4), only retweets (see Figure 5) and only mentions (see Figure 6).

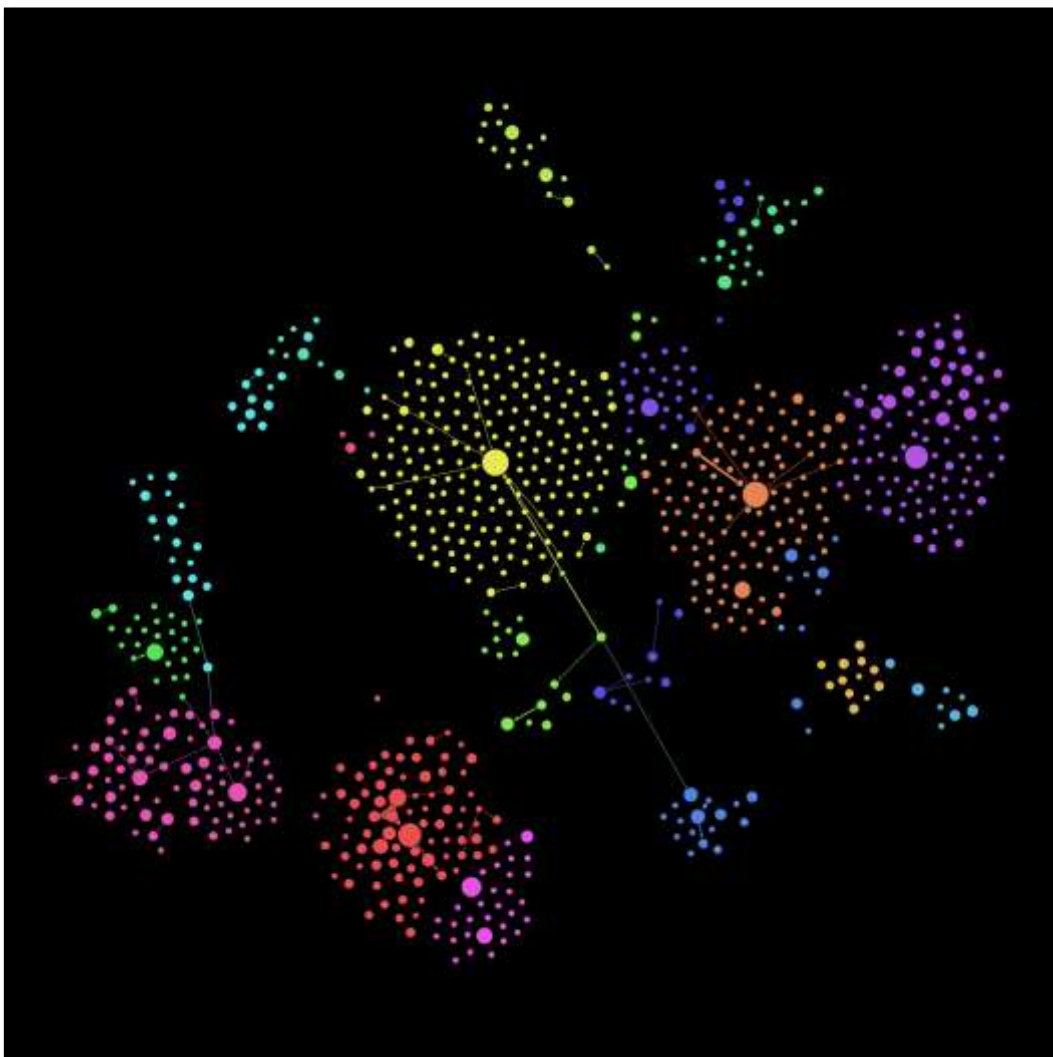


Figure 2. Giant component graph (replies only)

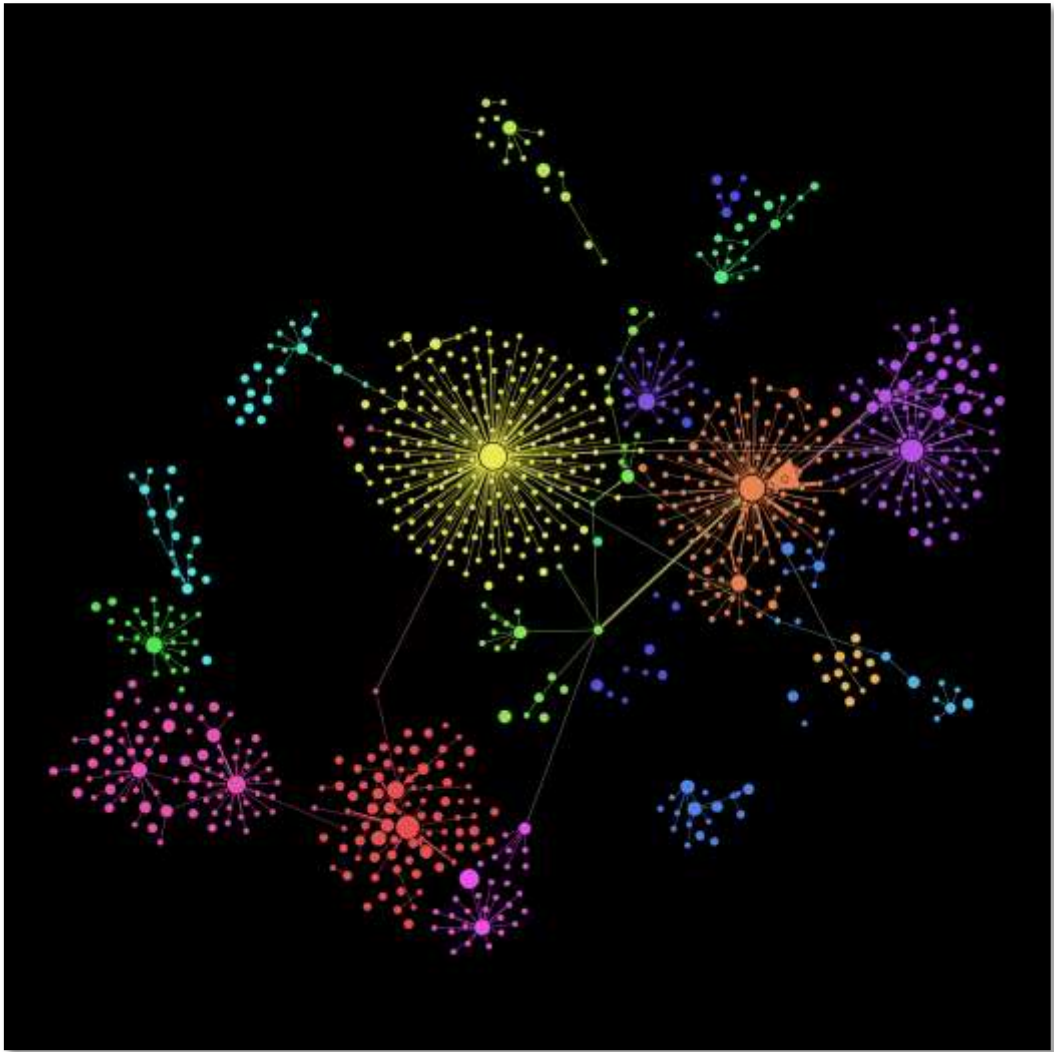


Figure 3. Giant component graph (retweets only)

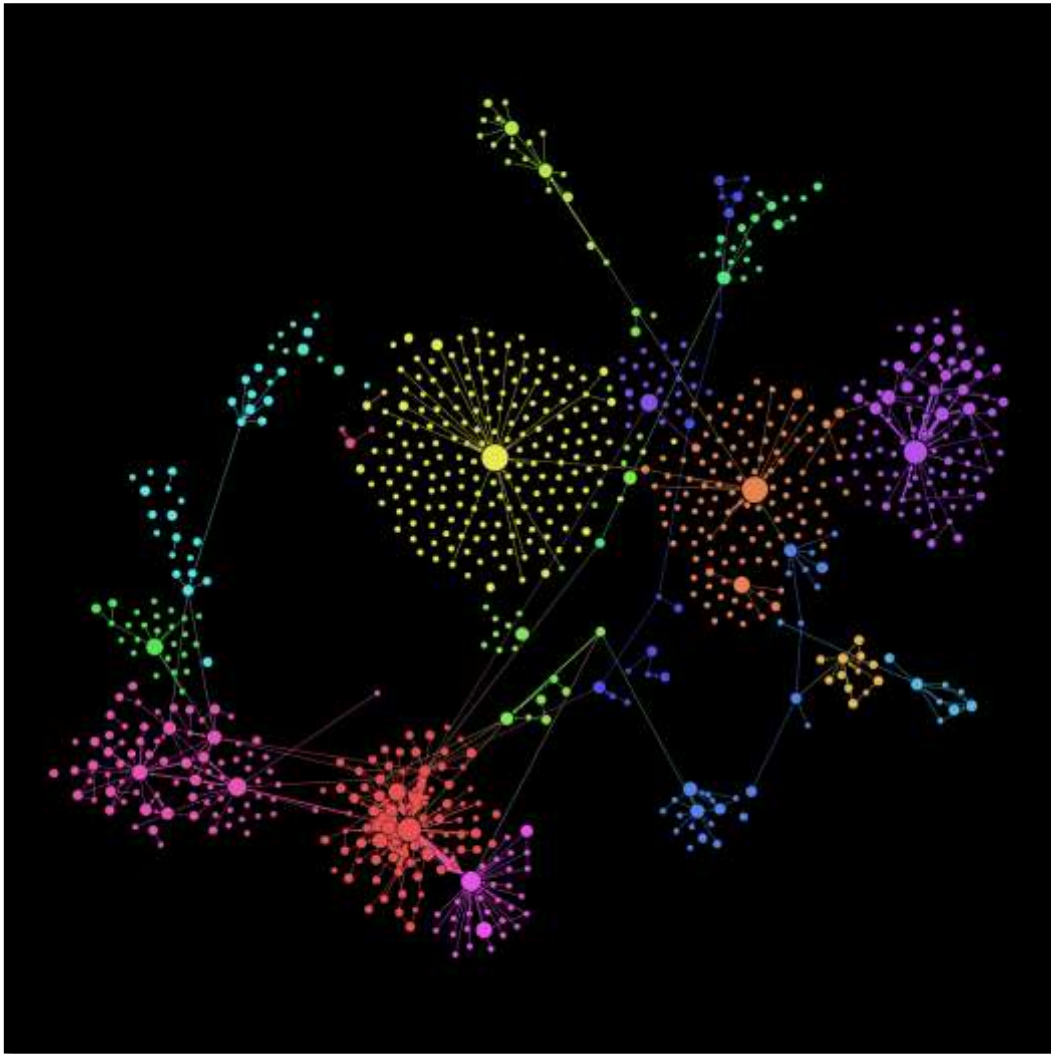


Figure 4. Giant component graph (mentions only)

First of all, it is seen that direct replies play a minor role in communication of Twitter users within South Asia discussion (see Appendix 2 for discussion).

Second, it is seen that nodes that are highly involved in discussions (like the ones around SDPI) are relatively more often connected with mentions, while not that involved nodes (like ones around World Bank) have relatively more retweets. This observation makes previous results more robust: while with the World Bank users are just *retransmitting World Bank's content* by retweeting, with SDPI users are *creating their own content* (in which they mention SDPI and others), and hence actual Twitter debates start to emerge.

Looking at the cluster of nodes centred on BC, we can see both mentions and retweets in relatively big quantity. However, retweets seem to outweigh mentions a bit. Also, with mentions we can clearly see that there are several accounts that mention BC's main account in their Twitter posts far more than others (i.e. they

have thicker edges). It is worth trying to identify them by examining British Council's cluster in separation from the rest of the network.

Appendix 5: Network metrics

The social network graphs built for this study represents how different users tweeted to each other about South Asia. Each node (○) represents one Twitter account (or Twitter user). Each edge (→) represents a tweet which goes from one user to another. We say "A's tweet goes to B" or "A tweeted to B" ($A \rightarrow B$) if one of the three cases occurred:

- User A **replied** to a post of user B (using Twitter "Reply" functionality);
- User A **retweeted** a post of user B (i.e. user A posted a copy of user B's post which indicated that B was the original author);
- User A **mentioned** user B in their post using Twitter's conventional symbol "@".

The thicker the edge from A to B is, the more times A tweeted to B (most of the edges are thin and represent only one tweet).

Network analysis is a distinctive research perspective within the social and behavioural sciences because it focuses on the importance of the relationships between interacting units (Wasserman and Faust, 1994, p. 4) The 'relationships' and 'interacting units' analysed depend entirely on the context. They can range from the family ties in Renaissance Florence, (Padgett, 1994) to connections in covert terrorist networks (Krebs, 2002), to calls and between mobile phones in Côte d'Ivoire, (Global Pulse, 2013).

In each case the relationship is represented by a line, known as an edge or arc, connecting the two 'interacting units' each known as a node. As data is added the network grows from one connection between two points (known as a dyad) into large network representations such as the 69 billion friendship links between 721 million Facebook users analysed by researcher at Università degli Studi di Milano, Italy in 2012 (Backstrom et al. 2012)

To create a representation of the information sharing network on Twitter for tweets using the hashtag #100women, an 'edge' was created for each user that retweeted or mentioned another user. This enables us to see who is interacting with whom in the network. Most elements of the network visualization and analysis were conducted using Gephi, with additional analysis conducted using igraph in R and Networkx in Python, to check the calculations of network metrics.

Within network analysis, one group of these metrics are measures of 'centrality'. Each *Centrality* measure provides a different perspective on how important (central) a node is within a specific network. There are a wide range of options for calculating centrality (Valente et al. 2008) but our study used three, Degree, Betweenness and PageRank. Each measure is described below.

Degree:

Degree Centrality is, in simple form, the number of relationships which connect to a specific node. For example, if I had five friends and drew a network graph which represented these friendships, the node representing me would have a degree centrality of 5.

In formal terms, the degree of a node is the number of lines that are incident with it (Wasserman and Faust, 1994, p. 100)

Betweenness:

Betweenness centrality refers to how often a node lies on the shortest path between any two nodes in the network. Actors ranked highly on betweenness centrality, therefore, have the potential to influence others near them in a network (Friedkin, 1991), seemingly through both direct and indirect pathways. A node with high betweenness centrality can potentially influence the spread of information through the network, by facilitating, hindering, or even altering the communication between others (Freeman, 1979; Newman, 2003).

Thus, 'Betweenness Centrality' focuses on nodes that are both retweeted/mentioned by others *and* retweeted, mentioned someone else themselves. High betweenness often indicates a unique or nearly unique position bridging between one group of users and the rest of the network as all the shortest paths have to pass through that single user.

PageRank:

PageRank is a complex calculation of a probability distribution for nodes in a network. It calculates how likely a user is to reach a specific node from other nodes in a network. The full explanation for PageRank was presented in a paper “The Anatomy of a Large-Scale Hypertextual Web Search Engine” (Brin and Page, 1998) this paper set out the design of a system revolutionised the process of delivering web search results - Google.

A short hand way of thinking about PageRank is that the PageRank of ‘node A’ is influenced by the degree centrality of ‘node A’ in conjunction with the degree centrality of the nodes which connect to ‘node A’.

The reason PageRank takes both these elements into account is that It uses the idea of a ‘random surfer’ finding their way across the internet by clicking a link on a web page, landing on the next web page and clicking a link which takes them to a third page and so on. Using the concept of the random surfer Sergey Brin and Larry Page (the ‘page’ in PageRank) applied the concept of the random surfer to web search through the ‘intuitive justification’ that web pages “that are well cited from many places around the Web are worth looking at. Also, pages that have perhaps only one citation from something like the Yahoo! homepage are also generally worth looking at”(Brin and Page, 1998)

In our case, this logic could be restated; people who are retweeted a lot are worth looking at, as are people who were retweeted infrequently – but when they are it is by well known account – perhaps a BBC Twitter account, or @BarakObama for example.

Calculating PageRank requires the researcher to define the damping factor, how likely the ‘random surfer’ imagined by Brin and Page is to jump from browsing one interconnected set of pages to begin browsing another set of interconnected pages. For our use of PageRank the damping factor was set at (0.85 / 15%). This damping factor was selected as it was the level suggested in Brin and Page (1998) and also highlighted by Becchetti and Castillo (2006) who observed in their analysis of PageRank that the “typical damping factor used in practice is between 0.85 and 0.90”.

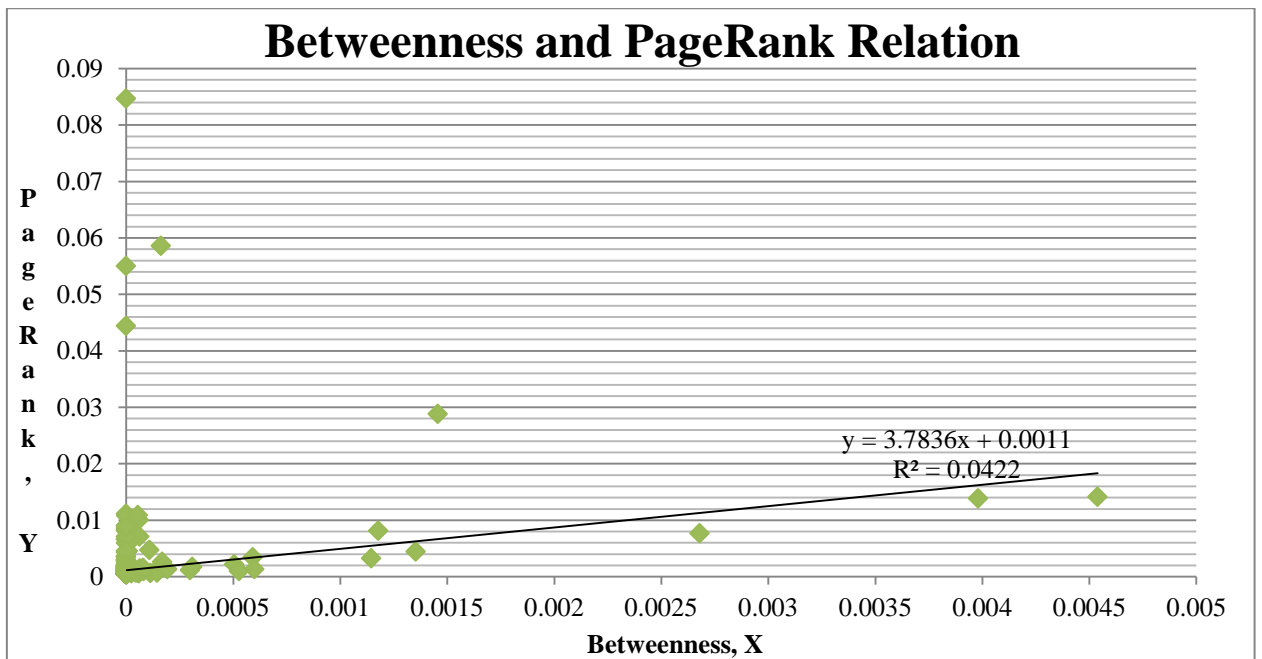
Appendix 6: Key actor Analysis

Key actor analysis uses a scatter plot of two related metrics of network centrality to identify members of the network that rank highly on both metrics and those outliers

that rank highly on one metric but not the other. This builds on the work by Thomas Valente et. al (2008) and Drew Conway (2012)

The key actor analysis is based on an expectation of a correlation between network metrics. Valente et al. (2008) concluded their work comparing the correlation between network metrics across nine previous network analyses that; “The level of correlation among measures seems nearly optimal - too high a correlation would indicate redundancy and too low, an indication that the variables measured different things”. Although the 2008 study did not include PageRank, it did include the related measure of Eigenvector centrality.

The original suggestion by drew Conway was to use Eigenvector for the key actor analysis; however, we suggest Pagerank would be a viable alternative. This is because of concerns about Eigenvector in directed graphs with low density. To balance this concern with the perspective which Eigenvector provides, pagerank has the potential advantage of including ‘random jumps’ – also referred to as damping factor. The damping factor for the analysis could set at (0.85 / 15%). This damping factor was selected as it was the level suggested in Brin and Page (1998) and also highlighted by Becchetti and Castillo (2006) who observed in their analysis of pagerank that the “typical damping factor used in practice is between 0.85 and 0.90”.



This graph is the original version of the graph included in report.

Figure 11 plots Betweenness and PageRank for all accounts. In addition to the findings presented in the report, we did not find a significant correlation between Betweenness and PageRank. This is unusual as previous work Valente et al. (2008) indicates one would expect a correlation between the values and the concepts described in Conway (2012). It shows that in this network there is a very weak relationship between PageRank and Betweenness, and also there are no accounts that would score very high in both measures. This indicates that there are no unambiguously central accounts for the South Asia Twitter discussion as a whole. Also it shows that, to some extent, there is a trade-off between acting as an information broker between different parts of a network (high Betweenness) and being a popular source of information (high PageRank).

As it can be seen, the nodes are very dense at the lower-left corner of the graph. The area with higher nodes density represents those accounts which do not score high in any centrality metric and thus do not play a critical role in the network. These nodes are excluded from subsequent analysis. More precisely, further only the nodes with either Betweenness more than 0.001 or PageRank more than 0.02 are examined (see Figure 12).

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