AARHUS
UNIVERSITET

MEASURING IMPACT ACROSS SOCIAL MEDIA

AN ANALYSIS OF THE DIGITAL SOCIAL LAYER ON NORTHSIDE FESTIVAL
AS A LARGER CULTURAL EVENT IN AARHUS IN 2014

Colophon

Content

Preface

The rethinkIMPACTS reports are the important results of the cooperation between Aarhus University and Aarhus 2017. The reports will contribute to creating new knowledge about the many different aspects of being a European Capital of Culture. The reports seek to communicate the findings of the different research and evaluation projects that will be completed before, during, and after 2017, as part of the rethinkIMPACTS 2017 project. The purpose of these reports is to disseminate this knowledge widely.

This project was initiated and carried through in 2014 as one of the first seed money funded research projects by rethinkIMPACTS 2017. The purpose of the project was to develop software to the digital social layer of a certain event (in connection with Aarhus 2017) and how users express themselves and interact through participation in connection with the event across social media. A partnership with NorthSide was chosen as it is one of the major existing cultural events in Aarhus. We assumed that the method developed and the evaluation given can provide inspiration for the tracking and measuring of impact on other events in connection with Aarhus 2017. This report contains information about the project as such, including an introduction to NorthSide Festival as a cultural event and Digital Footprints as the software used for collecting data. Furthermore, the report passes on central findings on the project and information on how we got to these findings, including an examination of the methodological pillars that the project is built upon.

1.0 Summary

When we analyzed the digital social layer of the event Instagram turned out to be the *most used social media platform* on NorthSide Festival 2014 compared to Twitter and Facebook. The activity on Facebook is surprisingly low and the activity on Twitter is surprisingly high compared to the general penetration of the platforms in Denmark. This however may be due to coinciding target groups between Twitter and NorthSide (creative and communication industry users).

When we zoom in on the activity on Facebook it becomes clear that the little activity taking place is primarily *before the concerts* around noon (presumably before the guests leave for the festival venue) and also after the festival.

A lot of the uploads on social media platforms during NorthSide Festival 2014 had to do with *other* aspects of the festival than the actual concerts. People *do* post pictures and status updates about the musical elements, but more considerably they seem to upload content on other aspects, such as the venue, the food, pre-parties, breakfast (before heading to the festival venue) etc. However, when posting about the concerts, the headlining acts seem to generate the most uploads.

'Northside_dk' (the official page on Facebook, Twitter, and Instagram) is naturally one of the most contributing actors to the digital, social layer during the festival. But otherwise *the activity is very widespread* on different users. Also, the people being most active on Facebook are *not* the same ones being most active on Instagram or Twitter, which suggests a differentiated use of the platforms.

In the private Instagram streams 77 percent of the posts were tagged with the official hashtag for the festival, #NS14, indicating that the festival partici-

pants wanted to enroll in an online community of fellow 'Northsiders'. Also, it seems that the use of the official hashtag facilitated a form of community of practice, allowing the festival participants to add an extra digital social layer to their (physical) festival experience.

2.0 About the project

2.1/ NorthSide Festival 2014

NorthSide Festival is a newly established Danish indie music festival. The festival has gained traction the last couple of years and seems to continue to grow. The festival took place three days in June from 13th to 15th. 2014 and 41 concerts were held for 35,000 people during these three days. The festival both had big international names such as Arcade Fire, Lana del Rey, and White Lies along with Danish bands as well.

NorthSide 2014 was chosen as case for this project, because the event has a large number of paying and presumed dedicated users who encourage "unique opportunities for engagement with music that is more active than in other settings" (Packer & Ballantyne, 2011, p. 165). Also, NorthSide Festival has officially proclaimed that they want to be characterized as a *social* festival that actively and purposefully involves the attending guests within the branding of the festival through social media activity (Boesen; Cules Nielsen). Furthermore, statistics show that social media in Denmark have gone mobile (Statistics Denmark, 2014). This tendency is interesting as NorthSide Festival takes place at an outdoor venue, where it is necessary to use smartphones in order to use social media. The target group of the guests of NorthSide Festival in fact also falls right into the demographics of those in Denmark who engage the most in social media on their mobile devices (Epinion, 2013, p. 45 ff.).

2.2/ Digital Footprints

Digital Footprints (www.digitalfootprints.dk) is a data extraction and analytics software that allows researchers to extract user data from Facebook and Instagram data sources; private data with user consent (e.g. profile information and feeds) as well as public streams (e.g. open groups, pages and hashtags). In the software researchers can either export data for external analysis, prepare qualitative or quantitative coding in the visual interface of the Digital Footprints software or run basic descriptive statistics (development over time, amount of updates, pictures, comments, shares, likes, and word count). The application is initially designed to optimize small-scale, in-depth qualitative user studies with the intent to study a small sample or a panel of users. Now the software has also been used to collect data in large sample studies and on public data streams (see also Bechmann & Vahlstrup, 2015).

Digital Footprints use the application programming interfaces (APIs) to retrieve data for research purposes even though the APIs are made for developers to primarily integrate with gaming or service apps (Lomborg & Bechmann, 2014)

2.3/ About the project 'Measuring impact across social media'

The aim of this study was to analyze the digital social layer of a music festival (the indie music festival NorthSide in Denmark). Through Digital Footprints we collected data from the festival's official Facebook page as well as their Twitter and Instagram account along with five hashtags from Instagram and Twitter (using YourTwapperkeeper) including the official hashtag (#ns14). The official hashtag was collected from two months before the festival and until a week after the festival.

Furthermore, we interviewed and collected private streams across platforms from 16 participants sampled to maximize variation (age, gender, education) within the target group of the festival. The participants were recruited through the Northside newsletter and website and through second order network of friends on Facebook.

The aim of the research project was to:

1. Examine methodological potentials and challenges in collecting and analyzing data across social media platforms
2. Analyze what characterizes the digital social layer of the festival in a quantitative matter i.e.
   a. Amount of activity across platforms?
   b. Who posts and is it the same users across platforms?
   c. Is it the same content across platforms?
   d. How does the digital layer relate to the program of the event?
   e. How does the digital layer relate to the physical event?
3. Analyze what characterizes the digital social layer of the festival in a qualitative matter i.e.
   a. What difference does social media make to the festival participants, and how is social media contributing to the overall festival experience?
   b. How does the digital social layer – exemplified by the use of the official hashtag of NorthSide, #NS14 – affect the participants' experience of the festival as an event?

The research contribution of the study is to try to look at social media analysis not from a silo perspective analyzing each platform and the connected activity (data) separately, but to investigate if and how it would make sense to analyze the social media data across platforms and compare the data as a totality; as a digital social layer on a physical bound event.

3.0 Methods and Research Design

This section will account for methodological potentials and challenges in analyzing the digital social layer. The section text is copied from an article in review to be published in an academic journal.

The research project builds upon a two-fold API study (Neuhaus & Webmoor, 2012; Lomborg & Bechmann, 2014). We extended and used the Digital Footprints software:

1. To collect data from the official Facebook page, the Instagram account, and hashtags for NorthSide 2014,
2. And then recruit a smaller number of users at the event and collect their Facebook and Instagram data in order to contextualize the findings in the public data.

Furthermore, we used YourTwapperkeeper to collect public hashtag data from Twitter as well in order to compare streams across all three platforms. Even though NorthSide also makes use of Snapchat it is not possible to collect data on a legal basis from the platform, as the platform does not provide a data API for developers for data extraction.

The main methodological challenge in this study was to expand Digital Footprints to Instagram data collection as well. As our research interest was to examine the characteristics of the digital social layer of the festival and how the festival event took place across social media we also analytically needed to come up with a way to compare the digital traces on Facebook, Twitter, and Instagram. We therefore had to decide that a heart on Instagram was comparable to a like on Facebook and a favorite on Twitter. Comments, tags, time codes, and geo-locations were comparable whether on Facebook, Twitter (@mention) or Instagram, and a Facebook status update was comparable to an Instagram photo/video and a tweet.

However, comparing different social media services is not trivial, as they each have their own communicative rules, logic, and content format (van Dijck, 2013). Instagram has for instance no share function, as it is the case for Twitter (retweet) and Facebook. Also, hashtags are not 'administered' by one organization (as it is the case with a Facebook page), which thus requires more data cleaning, because one hashtag can relate to other topics/events as well as the one of interest.

Whereas hashtag analyses capture communication between users and organizations, accounts on Facebook (also Facebook pages), Twitter, and Instagram primarily capture communication led by the event organizer, thus leaving a lot of the 'social media layer' communication of the festival to the personal feeds. For instance we assumed that not all updates were tagged with the five most common hashtags on Instagram and Twitter hence weakening the research design if the personal feeds are not included in the study. Therefore, we chose to collect mainly public feeds, but wanted to use the smaller sample of personal feeds among others to test the method; approximately how much of the data was visible in the public feeds and how much data did we miss.

This research design led to analytical perspectives such as measuring amount of data uploads (updates and comments) before, during, and after the festival across the three different platforms to analyze the peak moments of each platform. We also measured the amount of data and manually coded the content of the streams (subset) according to the time codes of the festival music program to see if some concerts created more data than others and what kind of data they created.

Lastly, the team used word count to compare content across platforms, geo-location data to show the impact of the festival in terms of where the data was uploaded from on different geographical scales (world, country, city, and festival venue). Furthermore, the teams used network analysis to analyze whether it was the same users who posted the most on different platforms

and if the users tagged content with the same hashtags (see also Bechmann, Jensen & Vahlstrup, 2015).

3.1/ Quantitative methods

For the quantitative study we collected the public streams of NorthSide (Facebook page, Twitter hashtags, and Instagram hashtags). We then analyzed the data using mostly quantitative content analysis, (Krippendorf, 2003) descriptive statistics, clustering and social network analysis (Prell, 2012).

Through Digital Footprints we collected data from the festival's official Facebook page. In collaboration with NorthSide we then registered all hashtags used in connection with the official hashtag on Twitter and Instagram and collected the 5 most common co-hashtags including the official hashtag (#NS14). The hashtags were collected weeks months before the festival and until a week after the festival.

3.2/ Qualitative methods

As mentioned, we recruited 16 participants (sampled to maximize variation of age, gender, and education within the target group of the festival) at NorthSide Festival 2014, whose private data stream we collected (from Facebook, Instagram, and Twitter). Afterwards, we interviewed them about their data; asking them to reflect upon intentions and expected response from other users of the social media platforms. The interviews were conducted individually and semi-structured, so that there was room for reflection and analytically qualified 'detours' (Kvale & Brinkmann, 2008, p. 119). By first retrieving data (answering "what") and then asking the participants to explain and elaborate on the data (answering "why"), we managed to combine datamining with sense making, which is comparable to what ethno-mining is aiming to achieve (Aipperspach et al., 2006; Anderson et al., 2009).

3.3/ Analytical potentials and challenges to the methods

Whenever conducting research including both quantitative and qualitative methods, issues within two general challenges will almost always be of interest: Data quality and ethical considerations.

3.3.1/ Data quality

Even though both Facebook and Instagram provide an API that allows researchers to collect high quality data through Digital Footprints there is still little if any documentation of the API structure. Furthermore, the APIs are not as stable as the live data feeds. This in turn leaves the researchers using Digital Footprints (or any other data collection app) with data that has a time delay. Moreover, live data on Facebook from partners is not included unless the researcher knows specifically if the user has installed a certain app (e.g. Spotify or Endomondo), and when going back in time in the data collection it is difficult for the researcher to see if data patterns occur due to changes in the user interface or due to the API structure.

The APIs are designed for developers of e.g. games, quizzes, and other user action oriented apps. The degree or type of accuracy in such cases is different from using the API for research purposes. These types of apps do not need to have a complete one-on-one mapping of the user activity data, but enough to optimize the service for the user. Thus, the challenge is that we do not know what kind of data we collect and what we are missing. In other words: where are the blind data spots? Do we see them all? In some cases researchers can do reverse engineering inspired approaches by looking at public available data, but when using private data this is more difficult. In these cases we need supplementary methods to test the data quality. For instance through interviews and observations as we have done in this project in particular.

3.3.2/ Ethical considerations

Users on social media platforms such as Facebook, Twitter, and Instagram often neglect to read privacy policies, which causes that users do not read through the permissions. Therefore, we made sure that the participants, who signed up to having their data collected by Digital Footprints knew what they agreed to by making them read a text and a bulleted list explaining the project details and what the software would get access to. Also, the participants were informed that they could cut off the data retrieval at any time.

4.0 Findings

4.1/ Findings in the public streams

In the following section we will focus on presenting the findings in the public data streams according to our research interest in what characterizes the digital social layer of the festival. The section text is copied from an article in review to be published in an academic journal.

4.1.1/ Amount of activity across platforms

In order to understand the impact of the digital layer across social media we needed to analyze how much data is uploaded before, during, and after the festival on the three largest services Facebook, Instagram, and Twitter.

One of the main methodological challenges in comparing impact across social media is the differences between the platforms. Here we have measured tweets and retweets on the hashtag "#ns14", instaposts and comments on "#ns14" and page posts and comments on the Facebook page. However, whereas the hashtag represents the stream from users to users the Facebook page is administered by NorthSide themselves. This is indeed a methodological issue. Though, in case of NorthSide the Facebook page mostly contains content posted by users.
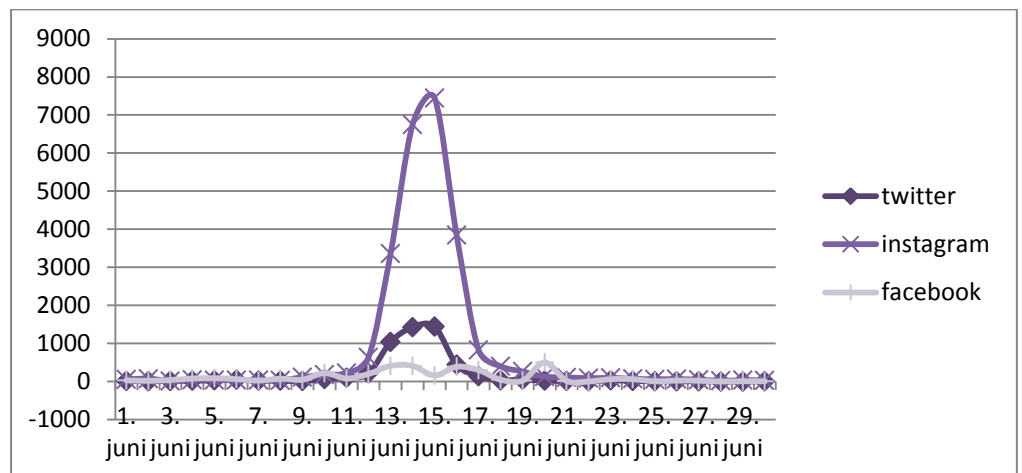
We can see that Instagram is the most used social media compared to Twitter and Facebook. Facebook is surprisingly low and Twitter surprisingly high compared to the general penetration in Denmark. This however may be due to an overlap between the Twitter target group and the NorthSide target group (creative and communication industry users).

*What kind of patterns do we see if we zoom in on Facebook even though it is the less used platform during the festival?*
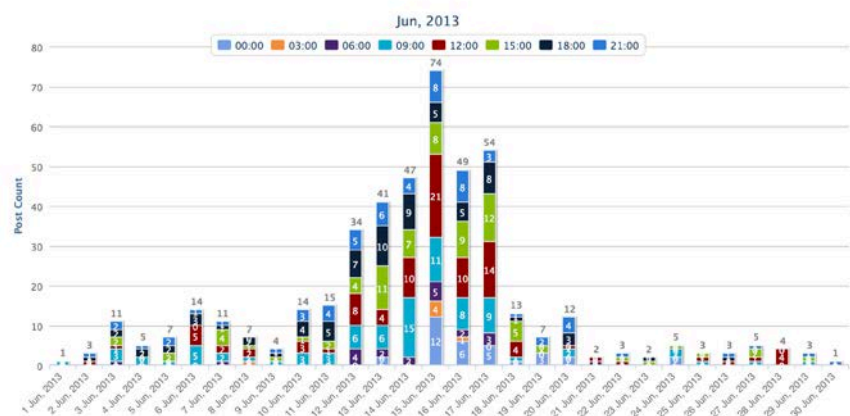
When we zoom in on the Facebook activity we can see that the little activity taking place is primarily before the concerts around noon (presumable before the festival guests leave for the festival venue) and also after the festival (second largest number of posts two days after the festival).

4.1.2/   Users across platforms

Is it the same people that add digital traces to the digital layer during the festival? "Northside_dk" naturally adds most to the digital layer, but otherwise the activity is very widespread on different users with four more contributing users on each platform, but it is not the same users in the top three.
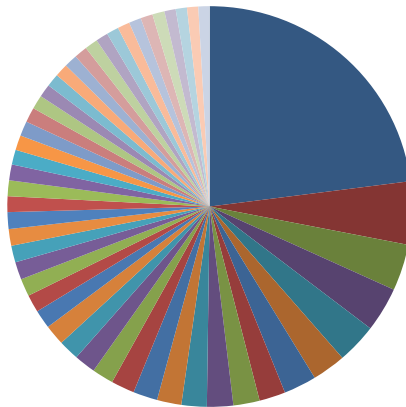

Top 50 posting users: Twitter #NS14

On the illustration we see top 50 posting users on Twitter using "#NS14". "NorthSide_DK" is the user who posts the most, the Danish Broadcasting Corporation radio station "P6BEAT" posts the second most, and the user "x" [anonymized] is the third most contributing user.
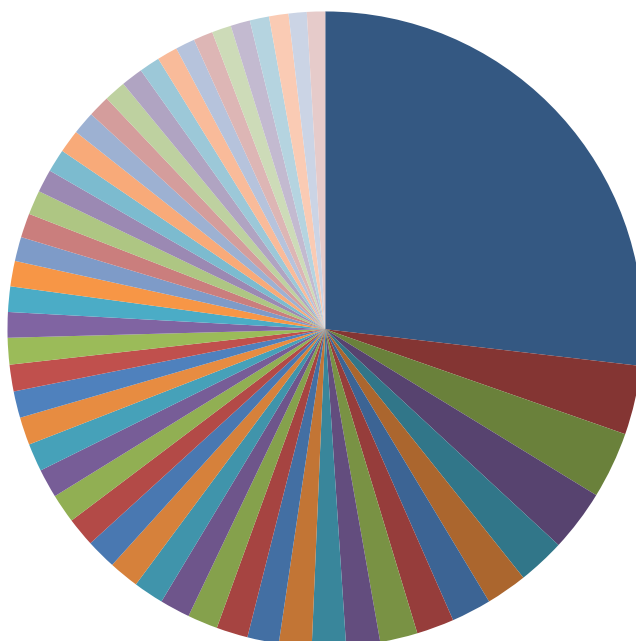
Top 50 posting users: Instagram #NS14

On Instagram (again with people using the "#NS14") a photographer employed by NorthSide to take pictures on the venue was the number one poster followed by "northside_dk" as second and the press responsible at NorthSide as third.
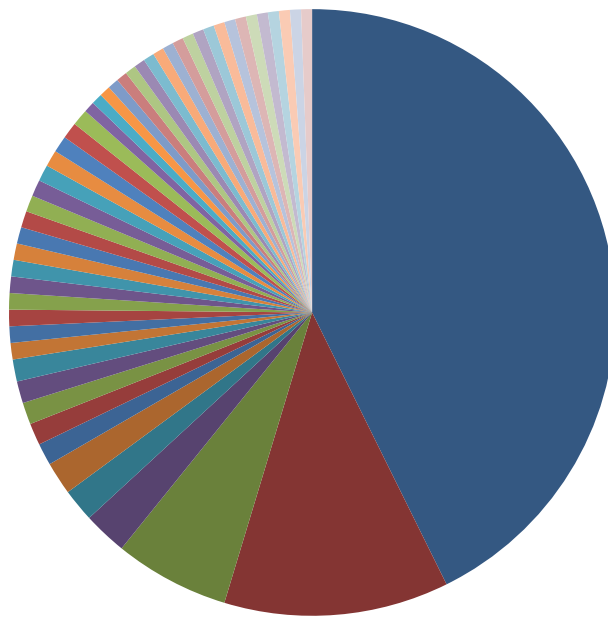
Top 50 posting users: Facebook posts (tagged and wall)

The top 50 posting list on Facebook (posts) is dominated by NorthSide in the top and the music magazines Gaffa and Soundvenue as second and third.
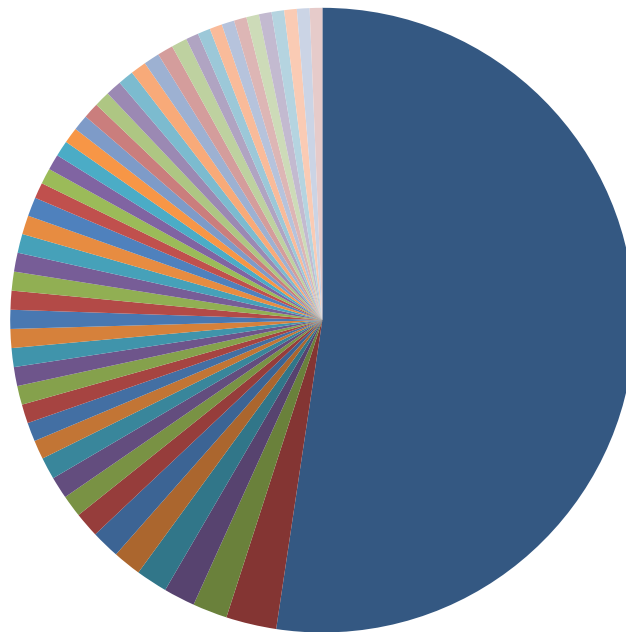
Top 50 posting users: Facebook comments

The list of Facebook comments within the top 50 posting users is once again dominated by NorthSide (number one), the user "y" [anonymized] as second and the user "z" [anonymized] as third.

We can conclude that apart from NorthSide it is NOT the same contributors in the top 3 that contributes mostly across the different platforms. Whereas Facebook is dominated by large music organizations, other users are more unknown. We can also conclude that it is not the same users who use "NS14" on Twitter and Instagram and post/comment on Facebook.

4.1.3/   Content across platforms

Is it the same content across platforms? If we look at the hashtags on Instagram and Twitter and compare them with the posts and comments on the Facebook page through word cloud we see that the words indicate different semantic usage patterns. Instagram is the platform for moods whereas Twitter and especially Facebook are platforms for complaints.

Tagcloud for Instagram hashtags related to NS14 stream.

Tagcloud for Twitter for hashtags related to NS14.

Tagcloud for posts and comments on Facebook page for NorthSide.

We can see that there is much more mood oriented tags on Instagram compared to Twitter where complaints of payment methods on the other hand
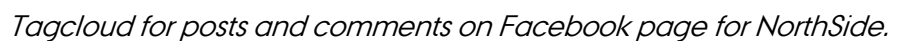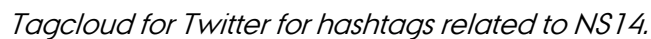
are more present and almost absent in Instagram tags. Interestingly "#la-tergram" is used as tag on both Instagram and Twitter. This may indicate that people choose to connect Instagram and Twitter feeds and it also indicates that people upload content later. This may be due to problems with battery level and internet connection (this was mentioned in many of the interviews we conducted).

Whereas Instagram mainly contains positive words and the names of the artists in the hashtags, Payband (and indications of problems) appear on Twitter. On Facebook the payment problems are more present both in the word "payband" but also in words such as wristband, credit card (dankort), cash, beeptify, and money. So do problems with queuing for the festival.

We can also see that Arcade Fire and the National are the artists who are most present in the content on the Facebook page. These two artists and the event surrounding them seem to have created larger impact on the digital social layer than other artists.

4.1.4/ The digital social layer and the event program

If we zoom in on Instagram, as the most used platforms on the festival in terms of amount of posts and comments – how does the content relate to the festival program and what characterizes the content more precisely?
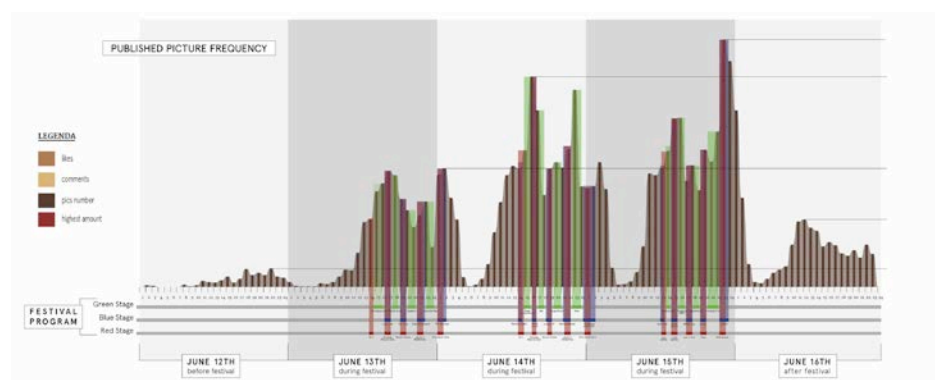
Source: Den Tex et al. 2014.

When registering the amount of pictures uploaded on Instagram during the festival and at the same time register which artists create most pictures, we see peaks on Brian Jonestown, Bombay Bicycle Club, Mew, and Queens of the Stone Age. However, this does not indicate who creates most impact on the digital social layer. If we look closer at the type of content uploaded during the concert we see that concert pictures play a minor role compared to other types of pictures.

Source: Den Tex et al. 2014.

When we look at the illustration pictures that relate to the concerts (blue) a minor part of the overall number of pictures are during these peak hours. For instance when we look closer at Queens of the Stone Age most pictures relate to 'saying goodbye' to the festival; an act of ritual closing instead of Queens of the Stone Age, as a band that generates engagement in the digital social layer. In total the concert pictures (blue) represent only about half of the pictures uploaded compared to sphere (beige), selfies (yellow), portraits, (red) and other (green).

This distribution of images in types corresponds with a hand coded subset on all Instagram pictures uploaded during Saturday at the festival (Ladefoged, 2014). Here concert pictures amounted to 42% of all images and the remaining 58% were primarily community pictures, selfies/self-portraits, and aesthet-

ic pictures of the scenery/venue. Surprisingly, the amount of community pictures was overwhelming and even selfies were primarily dominated by group selfies where a group of friends took pictures of themselves.

### 4.1.5/ The digital social layer and the physical event

How does the digital social layer map onto the physical event if we look at geo location data connected to the 200 most liked (red) and 200 least liked (blue) pictures.
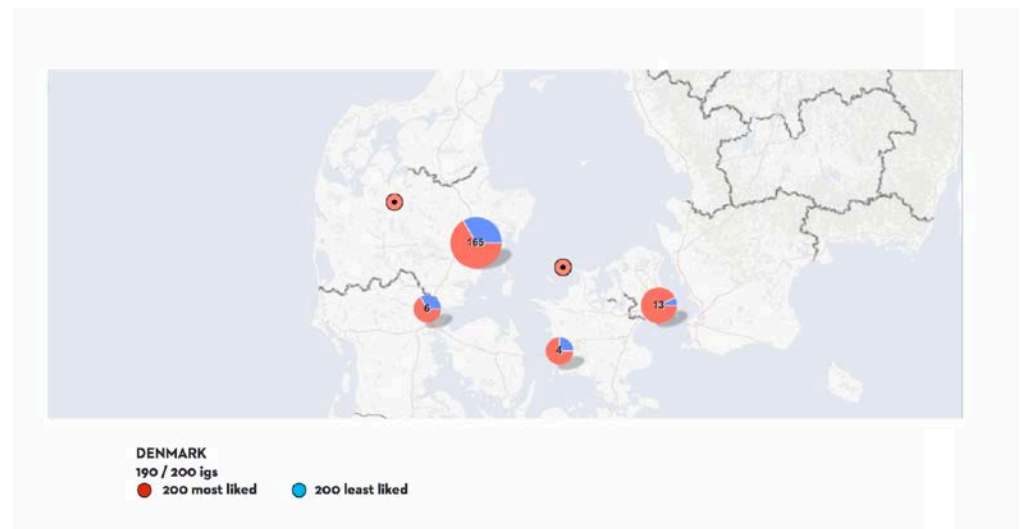
Source: Den Tex et al. 2014.

If we map the geo data on a map of Denmark we see that some of the pictures are uploaded other places than the physical event. If we look closer we also see that the picture uploads follow the train trip from Copenhagen to Aarhus and the ferry ride from Zealand to Aarhus. This may indicate that the festival, in the minds of participants, already begins during the journey to the festival and the digital social layer may facilitate such (physically and mentally) extended festival experience. In other words the festival participation is not isolated to the physical venue, but is more of a state of mind if we look at the Instagram pictures; here related to the physical event.

If we zoom in on the physical festival venue we also see some patterns in the geo located pictures.
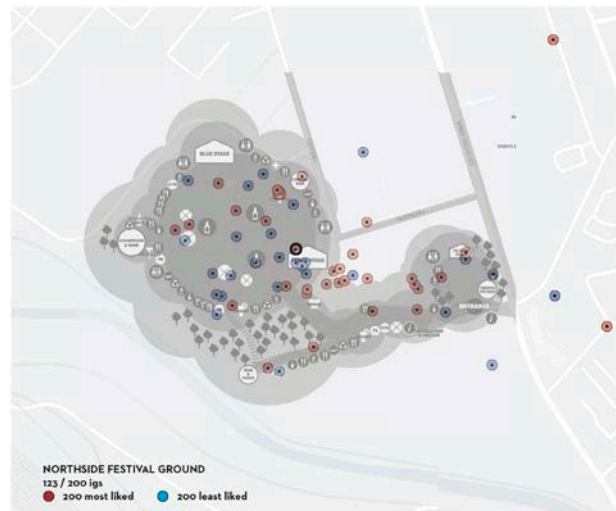
Source: Den Tex et al. 2014.

Here we see that "Green stage" generates most pictures when we look at the poles of most and least liked pictures on Instagram (e.g. Arcade Fire, Moe, Rudimental, Lana del Rey). However, as we already saw the concert pictures only amount for half of the total pictures so maybe the central place on the venue also plays a role in the large amount of uploads here. What we also see is that there is a large amount of the most liked pictures (red) that are up-loaded from the backstage area. This makes sense as this is the place where artists are located, before they go on stage and it is also the place where journalists are situated. We assume that both user groups have many follow-ers and thereby potentially generate many likes (thus appearing in most liked pictures).

4.2/ Findings in the private streams

In the following section we will focus on presenting the findings in the private data streams according to our research interest in what the digital social layer of the festival means to the festival participants individually. We will focus on Instagram, because it was by far the most used platform during the festival.

NorthSide Festival had a clear influence on the frequency for uploading and the content uploaded among the participating 16 users in this project. 281

pictures were uploaded to Instagram within the private streams in the month of June 2014. 139 of these pictures were about NorthSide Festival 2014. Out of the NorthSide related pictures 77 percent were tagged with the official hashtag for the festival, #NS14, indicating that the festival participants wanted to enroll in an online community of fellow 'Northsiders'.

And there is no doubt that #NS14 is one of the leading facilitators of adding an extra digital social layer to the festival if you ask the 16 participants involved in this project. The active *use* of the hashtag, enrolling in a larger community socially and digitally is comparable to what Wenger (2006) calls a *community of practice*. According to Wenger a community of practice is about *doing* something (hashtagging) *together* (hashtagging *along* with a lot of other people attending the same event):

> "It's about being social through one *shared* hashtag. Everybody here is able to hashtag their pictures with the same thing which makes it possible to see what everyone else has been doing while being here. It facilitates a feeling of community" (Male, 22).

Another participant agrees and adds the experience of being together while attending a concert:

> "You just know that people have been standing in a massive crowd while listening to The National together – same time, same place. By sharing a picture of a moment like that, you cherish it, and you can go back to that exact place and time in mind anytime" (Female, 18).

A third participant elaborates and defines the concept of hashtagging your pictures on Instagram as an interactive photo album:

> "I think it adds something. I used the official hashtag last year, in 2013, and afterwards I went through the pictures tagged with the same hashtag. I then got reminded of all the great memories from the festival and what I was part of" (Female, 27).

Yet there seems to be a conflict in the minds of most of the participants. While almost every single one of them shared, commented on or liked several posts from NorthSide 2014 during the festival, a lot of them also expresses a concern for not "being present in the now" because of the massive engagement in social media:

> "I *do* upload every day that I'm here at the festival, but you have to be present here and now, and one should be careful not to live through the camera instead of in real life" (Male, 34).

Another participant agrees:

> "I would rather have *real* contact to people around me, and I'm here for the music. The virtual room is fine, but the ones I'm attending the festival with, I call and talk to instead of communicating with them online" (Female, 35).

Despite the fact that the above quoted participants ideally would turn off their smartphone and be present with the people with whom they are attending the festival, they all check social media regularly and upload content during the festival. Enrolling in the digital, social layer of NorthSide thus overrules – or at least supplements – the "offline" sociality, as being social online adds another layer on top of the physical layer of the festival.

5.0 Evaluation of the methods used in this project in relation to future analyses of European Capital of Culture 2017

The software Digital Footprints has successfully been used to collect social media data during the event. In terms of data collection we were uncertain whether NorthSide could provide stable internet connection on the venue. This resulted in a need for the team to recruit and make interview appointments before the festival by recruiting through NorthSide newsletter and website together with second order network of friends. This may provide a reason for participants to upload more data or to consider data upload before actually sharing. Thus, the practical matter overshadowed this potential bias.

Future studies need to address this issue of internet connection as well if the software is used in connection with private streams. Even though it is possible to collect data on the venue on iPads, smartphones or other portable digital devices it is crucial that the Internet connection is stable as well. This is often difficult at larger events due to increased pressure from many users.

We chose to do interviews Saturday afternoon and Sunday in order for the participants to actually have had the chance to upload pictures before we asked about their usage patterns and sense-making. Ideally, the participants should have had the chance to experience the entire Festival before answering the questions. However, we were afraid that they would forget the instant considerations if interviews were scheduled after the event. In retrospect this could provide a larger overview of the total festival experience with the digital social layer and it would have provided us with an opportunity to look more closely on their data patterns before the interviews.

When analyzing the public data it has proven difficult to make meaningful impact analysis across platforms except for counting number of posts, connections, and user names. This is due to the lack of automated possibilities for

analysis especially when analyzing pictures versus textual status updates. We therefore ended up hand coding a subset of pictures on Instagram (e.g. the 200 most and least liked pictures).

Future work lies in trying to discover new ways to actually automate data analysis that can provide meaningful semantic analysis (text and picture) to contribute to the simple word counts and descriptions in tag clouds.

6.0 Litterature

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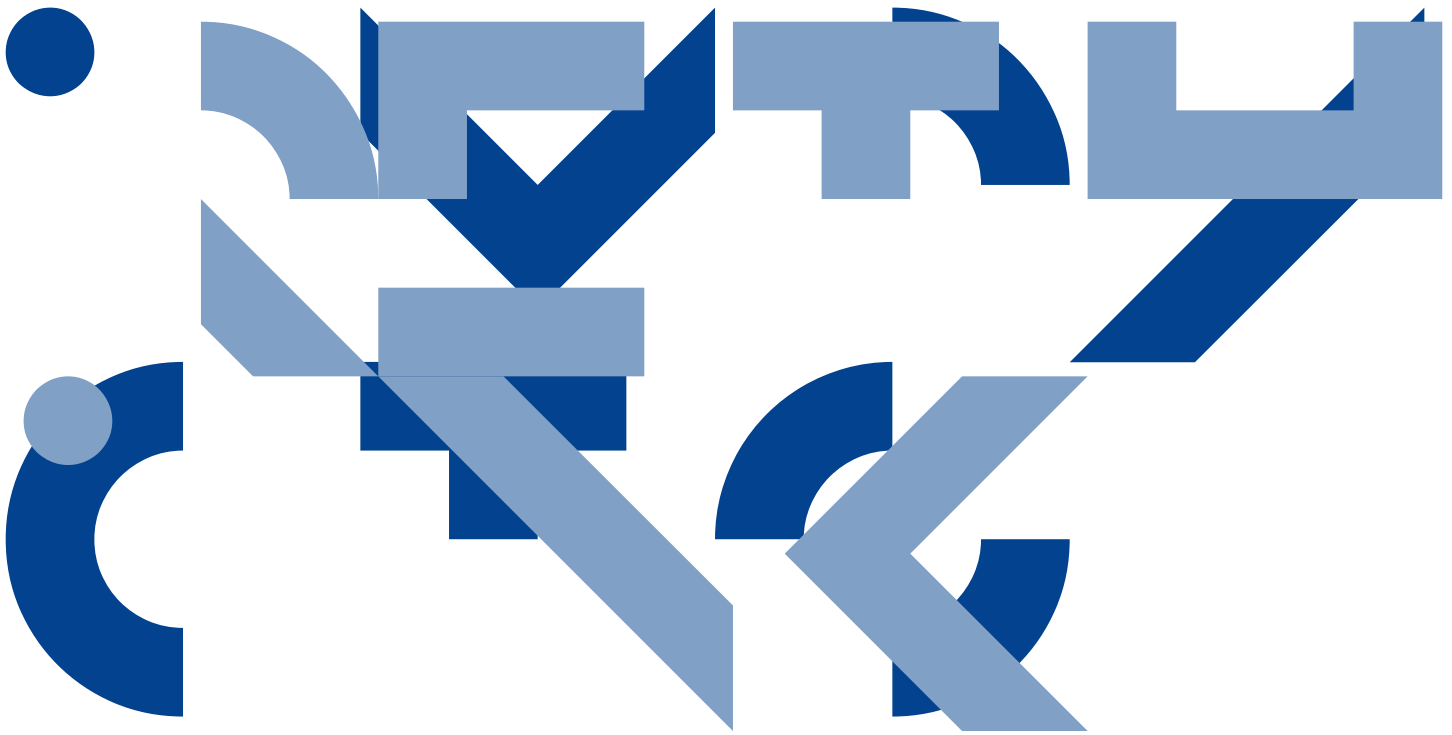
This project contributes to the knowledge exchange between Aarhus University and the city, Aarhus, by further develop-ing a software to analyze the digital social layer of a certain event (in connection with Aarhus 2017) and how users ex-press their identity through participation in connection with the event across social media. We collaborate with NorthSide Festival, as one of the major existing cultural events in Aarhus, but the method developed and the evaluation given we assume can be transferred to tracking and measuring of impact on other similar events in connection with Aarhus 2017.

This report contains information about the project as such, including an introduction to NorthSide Festival as a cultural event and Digital Footprints as the software used for collecting data. Furthermore, the report passes on central findings from the project and information on how we got to these findings, including an examination of the methodological pil-lars that the project is built upon.

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