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Authors	O'Riordan, Sheila;Feller, Joseph;Nagle, Tadhg
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Sheila O'Riordan
University College Cork

Joseph Feller
University College Cork

Tadhg Nagle
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EXPLORING THE AFFORDANCES OF SOCIAL NETWORK SITES: AN ANALYSIS OF THREE NETWORKS

O'Riordan, Sheila, Business Information Systems, University College Cork, Ireland, sheilaorio@gmail.com

Feller, Joseph, Business Information Systems, University College Cork, Ireland, jfeller@afis.ucc.ie

Nagle, Tadhg, Business Information Systems, University College Cork, Ireland, T.Nagle@ucc.ie

Abstract

Social network sites (SNS) are becoming increasingly important, both for individuals and organizations. These systems have affected social and cultural activities, work practices, and in particular the ways in which we discover, share and consume information goods. The functionality of SNS is emergent, shaped by user appropriation choices. In this paper, affordances are proposed as a way to understand the potential uses and future evolution of SNS. Affordances describe the characteristics of an interactive system which suggests how the system should be used. The objective of this study is to explore the affordances of SNS. The study comprises an inventory of the affordances of three popular SNS. The study reveals a diverse collection of software features which afford user behaviour in six areas of activity: social connectivity, social interactivity, profile management, content discovery, content sharing and content aggregation. The findings of the study provide a rich foundation for future research on user appropriation of SNS, the future evolution of SNS, and the design of SNS systems.

Keywords: Social Networks, Social Media, SNS, Affordances, System Inventory.

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1 Introduction

Since the start of the last decade, the progression of the Web has been influenced by user appropriations; becoming a social, interactive and participatory platform that enables people to connect, communicate, and collaborate in new ways (Russo and Peacock, 2009; Kaplan and Haenlein, 2010; Boyd and Ellison, 2008; O'Riordan *et al.*, 2011). Highlighting this progression, the term social media describes the group of Internet applications that facilitate the creation, organisation and sharing of information (Russo and Peacock, 2009). Moreover, within social media, the widespread adoption of SNS (Social Network Sites) is particularly notable (Lewis *et al.*, 2008). SNS provide an online space for the creation of personal information profiles and tools for interacting and exchanging content (O'Riordan *et al.*, 2011). These spaces enable users to shape both their own experiences and those of others (Russo and Peacock, 2009) and change how information is produced and consumed online (Hoegg *et al.*, 2006).

Given the key focus of socio-technical theories in the Information Systems (IS) domain, this study utilises affordances as the primary lens in exploring the nature of SNS, through an in-depth inventory analysis of three popular sites. The term affordance is used to describe properties of an object that facilitate actions for a particular user (Gaver, 1991; McGrenere and Ho, 2000). Affordances result "from the mental interpretation of things, based on our past knowledge and experience applied to our perception of the things about us" (Norman, 1988, p. 219), they are the *potential uses* of an artefact as perceived by a user (Markus and Silver, 2008). IT artefacts are developed according to a set of pre-identified requirements, but unintended functionality often arises after user engagement (Norman, 1988). By investigating both the intended affordances of a system and user perceptions, research can better understand how these digital communication networks develop through "the needs, values, and interests of people" (Castells *et al.*, 2006, p. 28). The remainder of the paper is structured as follows. In section 2, we define the phenomenon of interest (SNS) and discuss our conceptual grounding (affordances). In section 3, we use extant literature to conceptualize two general families of affordances evident in SNS: social and content. In section 4 we describe the system inventory method. In section 5 we present our inventory of social and content affordances for the three SNS. We conclude with a discussion of our findings and suggestions for future research.

2 Social Network Systems

SNS (e.g. Facebook, MySpace, Linkedin) represent a new technological capability for web users providing an environment for both hedonic and functional social interaction and collaboration (O'Riordan *et al.*, 2011). They are defined as web-based services that allow individuals to: (1) *construct a public or semi-public profile within a bounded system*; (2) *articulate a list of other users with whom they share a connection*; and (3) *view and traverse their list of connections and those made by others within the system* (Boyd and Ellison, 2008, p. 211). Having experienced an extraordinary growth in popularity, (e.g. Facebook has over 800 million active users of which 50% use Facebook on any given day (Facebook, 2011)), these social networks are structured around an individual and facilitate the creation and sharing of a wide variety of content (Boyd and Ellison, 2008). People contribute to these social networks with photographs, videos, links, opinions, recommendations, questions, reviews, and so on. These contributions are extremely important and are a key focus for designers as they build features to encourage such activities (Burke *et al.*, 2009). For instance, a 'content feed' or 'Social Awareness Stream' (SAS) has become a customary way of aggregating user contributions and sharing them across a network (Burke *et al.*, 2009). However, social networking features are not limited to dedicated SNS, these features have been added to a number of social media technologies; e.g. media sharing websites (YouTube, Flickr) (O'Riordan *et al.*, 2011). As a result, social network sites may vary in functionality and user base (Boyd and Ellison, 2008; Liu, 2007). Some sites integrate information and communication tools like photo or video sharing capabilities,

others use built□in blogging and instant messaging technology, these features will differ across SNS and will depend on system design intentions (Boyd and Ellison, 2008). With this adaptability it is important to understand a social network site's user base and the system's intended purpose.

2.1 Affordances

An affordance is "the design aspect of an object which suggests how the object should be used" (McGrenere and Ho, 2000, p. 1). Norman (1988; 2002) suggests that affordances are a combination of perceived and actual properties of an object. Affordances in this perspective provide strong clues about functionality and offer a variety of capabilities (Norman, 2002). Applying this concept to the space of IS, affordances are proposed as properties of the real world as interpreted by a specific user group. The literature suggests that while the properties of artefacts are relevant to explanation, alone they are insufficient for explanation (Markus and Silver, 2008). Thus, it is necessary to consider the interactions between actors and artefacts as relevant properties of the artefacts (Markus and Silver, 2008). Applying both affordance dichotomies to the space of IS, the term *technical objects* denote IT artefacts and their component parts (which are real and exist) and *functional affordances* represent their potential uses (Markus and Silver, 2008). Technical objects are designed to provide specific capabilities to users, however, people may not necessarily use them for their intended purpose; "causal potential does not equate with deterministic outcomes" (Markus and Silver, 2008, p. 621). Technical objects do not need to be perceived by humans in order to exist, "they must generally be perceived to be used. Thus, the concepts of technical objects are different from the concepts of users' perceptions" (Markus and Silver, 2008, p. 621). Affordances in this representation are a type of relationship that identifies what the user may be able to do with it, given a user's capabilities and goals (Markus and Silver, 2008; Grange and Benbasat, 2010).

3 Affordances of SNS

In the context of this study two families of affordances have been delineated for SNS: social affordances and content affordances. Social affordances of SNS are further divided into social connectivity, social interactivity, and profile management. Content affordances are divided into content discovery, content sharing, and content aggregation.

3.1 Social Affordances

Social connectivity affords the linking of individuals in a system, through both commonly held information (resource connectivity) and social contacts. In these systems individuals are placed in the centre of their own community with a visible list of connections and a profile page displaying personal information (Acquisti and Gross, 2006; Boyd and Ellison, 2008). These personal network systems enable visibility of user actions and provide point-to-point communication for users (Boyd and Ellison, 2008). The relationship of connections may vary according to the social network system and the following types are facilitated (Marlow *et al.*, 2006; Boyd and Ellison, 2008): (1) reciprocal: two-way connection and (2) following: one-way connection. Two-way connections require a bidirectional tie, where both users have access to the shared network and must confirm the relationship (Boyd and Ellison, 2008; Kietzmann *et al.*, 2011). One-way connections are unidirectional and enable users to be loosely coupled in a social network (Naaman *et al.*, 2010). Social network relationships will range from the known to the unknown and may be based on a number of different factors; whether work-related contexts, shared interests, a previous network etc. (Ellison *et al.*, 2007). These differing relationships may impact on how users interact and are therefore noteworthy (Kietzmann *et al.*, 2011).
Social interactivity refers to the potential for users to communicate with social connections. Within a network, communication consists of comments, posts, electronic mail, instant messaging, and rating. Human interaction is the basis for the links that are formed in social networks (Rybski *et al.*, 2009).

Communication can be synchronous or asynchronous and differs across the medium in which people interact. These methods of interaction are either public or semi-public and posted messages may be open to the entire community (indirect) or restricted to a user's designated contacts (direct) (Naaman *et al.*, 2010) Some of the main intentions for interactivity include (Java *et al.*, 2007; Naaman *et al.*, 2010): conversations between users, opinions/complaints, recommendations, comment/anecdote, statements and random thoughts, information/content sharing, self-promotion, questions, and presence maintenance. The **profile management** affordance facilitates users of an SNS to manage their unique profile and organise their personal information; this profile (re)presents their public identity (Acquisti and Gross, 2006). Individuals manage social presence (Kietzmann *et al.*, 2011) via this visible public or private space (Boyd and Ellison, 2008). Social presence facilitates the accessibility of a user and their connections (Kietzmann *et al.*, 2011). A profile will usually consist of descriptors such as name, age, gender, location, interests, a list of friends, and a personal information section (Boyd and Ellison, 2008; Kietzmann *et al.*, 2011), it may also include the ability to display a profile photo, add multimedia content, modify the profile's look and feel, and add modules (applications) that enhance the profile (Boyd and Ellison, 2008). Profile management is used by an individual to present themselves to others and undertake a role in a specific online space.

3.2 Content Affordances

Content discovery is facilitated through different mechanisms in an SNS (Cha *et al.*, 2009): (1) *featuring*; popular or interesting content displayed on a homepage, (2) *search results*; searching within a network for key terms, (3) *links between content*; grouping content based on characteristics, (4) *external links*; links to external websites and content, (5) *social network*; connection shared content, (6) *recommendations*; based on activity, interests and/or history, and (6) *specific applications*; topic specific applications. **Content sharing** refers to the potential for information dissemination along the social links in a social network. Content can range in modality from text, video, audio, links, photos etc. These social exchanges are known as "word-of-mouth" exchanges or "social cascades" and have the ability to reach different nodes in a social network spreading "content, ideas, or information widely and quickly" (Cha *et al.*, 2009, p. 721). **Content aggregation** is the ability for users to syndicate and aggregate content (audio, visual etc.). It involves collecting material from many sources and using it for personal needs (McLoughlin and Lee, 2007). Users of SNS have the capacity to create lists and groupings of content and users. These lists create a stream of content for an individual, based on personal preferences. These streams can be user built, customised for a particular topic, or are provided by the system functionality via SAS. Tagging is an important function in an SNS and allow users to annotate resources in order to store, collect, and retrieve them (Marlow *et al.*, 2006, p. 31).

Based on this taxonomy of social and content affordance concepts, derived from the literature, we operationalize our research objective in the form of three research questions:

1. What are the instantiations of the social affordances of SNS?
2. What are the instantiations of the content affordances of SNS?
3. How do the social and content affordances compare across the SNS?

4 Systems Investigation Method

To address the research questions and document the intended affordances of social network systems, a system investigation was conducted on selected social network sites to produce a system inventory. The system investigation was implemented in two parts: (1) *Documentation Analysis*: content analysis of system help guides for end-users and (2) *System Analysis*: walkthrough of system functionality to validate data in documentation analysis and explore features of the system. The user/help documentation of three SNS were reviewed in order to understand system features and their design based on system developer perspectives and the signals specified for end-users. Key themes were assigned to each feature and the social and content affordances were used to categorise and organise

the data (cf. Eisenhardt, 1989; Hair *et al.*, 2007). Content analysis "is a research technique for making replicable and valid inferences from text (or other meaningful matter) to the contexts of their use" (Krippendorff, 2004, p. 18). The use of data coding in this study enabled accurate analysis and reduced large amounts of data into a smaller number of analytic units, facilitating understanding of local incidents and interactions (Eisenhardt, 1989). Data reduction where raw data is selected, focused, simplified, abstracted, and transformed (Miles and Huberman, 1994) was employed during content analysis. The strategy for collecting and analysing the investigation data include the following steps:

1. Examine system documentation for intended functions and feature lists.
2. Code data under the following headings: document type, feature name, feature description, affordance types, and researcher comments.
3. Extract relevant features from coded data and categorise vis-a-vis social and content affordance types.
4. Undertake a feature and theme comparison across selected SNS.
5. Apply hierarchies to system features – identifying the key features and their sub-features.
6. Investigate the key feature categorisation across all SNS to identify similarities and differences.
7. Conduct system analysis based on findings and explore system functionality.

Three social network sites were selected from a list based on: (1) page rank (using data from Alexa.com), (2) type of social network, and (3) registered users. The SNS chosen are some of the top sites visited on the Web; their rank is determined based on a calculation of average daily visitors and page views (Alexa, 2011). Three different types of SNS were selected. Facebook is a social network site built around an individual's personal network. Facebook facilitates users to connect and share information with a bounded group of connections. YouTube is a video sharing site with built-in social networking features. YouTube's primary focus is the viewing and sharing of videos. The use of recommendations and browsing history is an important way for people to discover new content and navigate through the website. Twitter is a micro-blogging tool that enables users to discover up-to-date content and to share content with a group of followers. Twitter tracks content trends and facilitates people to interact on a global level. The three SNS differ in the way content is shared and organised, but are all general in nature, i.e. do not have any specific criterion for the type of content shared. The SNS chosen have a large base of registered users, which demonstrates their popularity and influence. The demographic for the selected SNS have a wide range but are typically associated with ages 18-54 (KissMetrics, 2011; YouTube, 2011). These particular social network sites can be linked with each other, either through connected accounts or "autoshare", and content can be embedded/shared within each site. Table 1 displays information including global rank, type, description, and estimated registered/unique users of each site.

Site (Rank)	SNS Type	Description	Users
Facebook (2)	Social Network	Connects people to share links, videos, information, content, etc.	800m +
YouTube (3)	Video Sharing	Enables users to upload, tag and share videos in a social setting.	800m +
Twitter (9)	Micro-blogging	Real-time information network for discovering latest content.	400m +

Table 1. Social Network Site Page Rank and General Statistics

5 Findings

In this section, we present the findings of the system investigation, structured around the three research questions. First, we discuss the results of the investigation in the context of the social affordances (section 5.1), the content affordances (section 5.2) and the additional affordance categories uncovered, as displayed in Table 2 and Table 3 consecutively. Finally, section 5.3 compares these findings across the three SNS.

5.1 Social Affordance Findings

The findings reveal that the **social connectivity** affordance is manifested in three ways; connecting, connection search/suggestions, and connection lists/groups. In Facebook the main type of connection enabled is the reciprocal relationship, i.e. you must accept a 'friend' request. This relationship usually signifies a known connection. Conversely, the unidirectional connections facilitate a user to follow interests and people (often public figures) not a part of their existing network. In YouTube the central link between users normally comprises unidirectional "subscribing". Subscription based connections create a link between a user and a channel's content. But users are not limited to subscriptions to find content so social connectivity is not essential in YouTube. YouTube's recommendation system enables a user to find content based on both direct and indirect connections. In Twitter the leading relationship is unidirectional; many one-way connections are formed based on a shared interest. Twitter enables users to form indirect ties by creating "lists" aggregating content from a number of sources. **Social interactivity** affordances are established in four ways: asynchronous and synchronous communication, rating/liking, and external interactions. Though most forms of interactivity are afforded in the three SNS, each site promotes specific types of interactions. YouTube primarily is a video sharing site, users can comment about video content, rate it, and then share it externally. Facebook promotes many forms of interactions in a variety of contexts, with the main method being "status updates" and the commenting and rating of these updates. People can be 'tagged' in posts, enhancing connectivity. Twitter interaction is basic but has evolved with user appropriation. Posts are quite short (140 characters max.) and they make use of specific characters that enrich interactions. Hashtags (#) and Mentions (@) enable users to link content and users together, creating semantic data within the system, facilitating future content discovery and aggregation. The **profile management** affordance is manifested through the ability to manage/edit a profile, profile updates, location tagging, external profile management, and mobile application. The profile feature in SNS is a feature employed by users as a representation of themselves, enabling the disclosure of personal information and the presentation of identity and image. In all three sites profile management enables a user to manage their profiles through features that facilitate editing personal information/content and control through external sources and mobile applications. What is significant about the selected SNS is the ability to link profiles to external sources (like other social media sites). A user can create an online identity through their chosen SNS and apply this persona to other online activity. Profile management controls the information linked to a profile and who has access to it.

5.2 Content Affordance Findings

Content discovery instantiations include the ability for users to encounter information and content through their social connections, through active searching, the management of user content through aggregation, and via external sources. To organise this data Twitter, YouTube, and Facebook all use SAS which aggregate activity into a timeline or feed in which a user can browse for updates. Most SAS are in chronological order but can be filtered using other key terms. Users are directed to links within the system or outside of the system. Often the content comes to the user, as opposed to users searching specifically. **Content sharing** is enabled through social interactivity and word-of-mouth exchanges. An SNS provides a user with the capability to share content, whether information, opinions, recommendations, links, videos, photos, and so on. The features that enable content sharing are aligned with the features that enable social interactivity. Specifically, content sharing is enabled through posts and updates by a user, including external links. The nature of Twitter only enables users to share short posts with links and tags within them. These links and tags are used to direct a user to either an aggregated list of tweets or to an external website to view content. YouTube enables users to share video content. YouTube videos can be rated and shared within YouTube or externally embedded within another website. Facebook again is the most varied in its capabilities of content sharing, enabling a user to share content in various contexts and to specific groups of people. **Content aggregation** takes a number of forms within the three SNS. They all employ a form of SAS.

Affordances	Twitter	YouTube	Facebook
Social Connectivity			
Connecting	– Follow	– Add Friend – Subscribe	– Add Friend – Like Pages/Community Pages
Connection Search/ Suggestions	– Browse Interests – Find Friends – Recommendations – Search	– Recommended Channels – Search Channels	– Connection Search – Friend Finder – People you may know – Recommended Pages
Connection Lists/Groups	– Lists	-	– Join Groups/Networks – Friend Lists
Social Interactivity			
Asynchronous Communication	– @Mention/@Reply – Direct Message – Tweet/Retweet – Automated Tweet	– Bulletin Posts/Channel Comment – Video Posts – Video Comment – On-site messaging system	– Comments/Posts/Notes – Messages (Text/Video) – Pages/Community Pages/Groups – Like/Tag/Places/Events
Synchronous Communication	-	-	– Chat/Group Chat – Video calling
Rating/Liking	– Favorite	– Favorite – Like/Dislike	– Like
External Interactions	– Facebook Application – Share/Link (External)	– Auto-share – Share/Embed Content	– Share/Link (External)
Profile Management			
Manage/Edit Profile	– Avatar – Bio – Design – Handle/Real Name – Profile Picture	– Channels – Homepage – Hometown/Location – Insight – Subscriptions	– Add Applications – Comments/Messages/Posts/Notes – Join Pages/Groups/Networks – Profile Photo/Information/Content – Like/Tag/Places/Events
Profile Updates	– Email Notifications – RSS Feed/OAuth	– Email Notifications – YouTube Newsletter	– Email Notifications – Internal Notifications
Location Tagging	– Geotagging/Geolocation	– Video Location	– Places
External Profile Management	– @Anywhere – Buttons/Widgets – Connections (applications)	– Auto-share – Embed/Share Content – YouTube Direct/Facebook/Twitter	– Instant Personalization – Linking to Twitter/External Login – Social Plugins
Mobile Application	– Mobile Application – Mobile: Short Code/Sleep Time	– Mobile Application	– Facebook Mobile Texts – Mobile Applications

Table 2. Social Affordances System Inventory and Categorisation

Facebook utilises a news feed of user activity updates. Twitter employs a "Timeline" which aggregates all of the tweets of selected profiles chronologically. YouTube has a variation of these SAS themes and involves not just activity streams of a user's subscribed channels, but also other recommendations based on a user's history and interests. These SAS keep people on social networks up-to-date with their connections and organises the content into manageable displays for browsing and locating interesting information. Tagging has become an essential feature for the aggregation of disparate sources in Twitter. Hashtags enable users to categorise Tweets based on relevant keywords. Based on these keywords tweets can be searched for easily and aggregated into a list for a user.

5.3 Comparison across the SNS

Social connectivity instances are evident in all SNS but the connection possibilities have differing significance. Facebook and YouTube support both forms of connectivity relationships, bidirectional and unidirectional. However, each type is promoted more in one SNS over the other. Facebook promotes *existing* reciprocal relationships as the main type of connectivity, where YouTube and Twitter promotes following users (whether known or unknown) based on content contributions. Facebook is more social network focused, constructed around users and their personal information and network, where YouTube and Twitter are content focused and are built around user interests. The indirect relationships that are afforded in the three SNS also differ. YouTube creates indirect connections based on browsing history and the system generated recommendations. In this way YouTube does not depend on subscription-based connections to find relevant content and to create a personalised experience for a user. Twitter's indirect connectivity consists of the creation of lists of users and keywords, and also through the ability to retweet others' contributions; thereby enabling propagation to further network nodes. Facebook enables indirect connections for a user by facilitating them to join groups or networks. Distinct from 'liking' pages, the users can see the list of connections and interact directly with them. The analysis reveals that the fundamental instances of social interactivity vary across the three SNS. Though most forms of interactions are supported, the nature of the websites and the intentions for use differ. Where Facebook and YouTube are media rich, Twitter cannot display media within the system but instead directs a user outside of the system to view the material. Facebook can display photos and videos, and can also direct users to the original source of the content. In Facebook an individual is at the centre of interactions with varying motivations for interacting with their community, whether it is maintaining social presence or sharing content. YouTube is based on video contributions, not on the direct interactions between users in the system. Twitter also promotes content over social aspects but social connectivity is essential to help the content reach a wider audience. Tagging is an essential part of these interactions in Twitter. Facebook has emulated this capability by enabling users to tag people in status updates etc., but Twitter goes a step further with the ability to tag keywords; creating a huge array of content around specific topics and enhancing the ability to locate it; this has impacted greatly on the content affordances. The role of the profile varies across the three SNS. Twitter has the most basic profile feature. It consists of a few descriptors and a timeline of chronological tweets. The profile in Facebook enables semantic links to be formed between a user and their interests; 'liking' is an important profile management feature. In both Twitter and YouTube the profile is less important than the content that a user shares, whereas Facebook emphasizes the profile as a focal point for a user. In all three, increased self-disclosure results in a richer environment for a network, i.e. the more metadata, the more accessible relevant content is. User contributions are extremely important to maintaining an image and online identity.

Content affordances are enabled through the social affordance features of SNS. Without social connectivity, social interactivity, and profile management, users would not be able to discover, share, and aggregate information. Similarly, content discovery is inherently linked to the content sharing and content aggregation affordances. The three SNS have similar ways of discovering content through different means of sharing and aggregation. Facebook and Twitter are organised based on the historical evolution of user contributions, whereas YouTube creates a snapshot of a user's interests

Affordances	Twitter	YouTube	Facebook
Content Discovery			
Interaction/Community Content	– @Mention/@Reply – Lists – Tweet/Retweets/Top Tweets	– Annotations – Bulletin Posts	– Applications – Comments /Messages/Posts/Notes – Pages/Community pages/Groups
Content Search	– #Hashtags/ Trends – Browse Interests – Searches/Saved Searches	– Search – Browse	– Search
Social Awareness Streams/Content Feed	– Timelines (Tweets/Retweets/ @Replies/Favourites/Lists)	– Charts/Featured/ Spotlight/Trend – Browse/Category/Topics – Recommendations/ Suggestions – Subscriptions	– News Feed – Related Posts – Wall
External Sources of Content	– RSS Feed – Widgets	– Citizen Tube – Creators' Corner Blog – YouTube Facebook/Twitter	– Share/Link (external) – Social plugins
Content Sharing			
Interactions/Community Content	– #Hashtags – @Mention/@Reply – Favourite – Tweet/Retweet – Promoted/Auto Tweet	– Annotations – Bulletin Posts – Description – Favourite – Live-Streaming	– Applications – Comments /Messages/Posts/Notes – Like/Tag/Places – Pages/ Community pages/Groups – Photos/Videos
External Sources of Content	– Buttons/Widgets – Applications – RSS Feed/OAuth	– Share/embed content – Auto-share	– Share/Link (external) – Social plugins
Content Aggregation			
Aggregated Content/Lists via SAS	– #Hashtags/Trends/ Top Tweets – @Reply/Favorites/ Retweet – Lists – Saved Searches – Timeline	– Annotations – Browse/ Category/Topics – Charts/Featured/ Spotlight/Trend – Favourites/Playlists – Recommendations/Suggestions – Subscriptions	– Applications – Comments /Messages/Posts/Notes – Like/Tag/Places – Pages/Community pages/Groups – News Feed/Wall – Photos/Videos
External Aggregation of Content	– Buttons/Widgets – RSS Feed/OAuth – Applications	– Citizen Tube – YouTube Facebook/Twitter	– Share/Link (external) – Social plugins

Table 3. Content Affordances System Inventory and Categorisation

based on browsing history and trends in the system. Where a user's direct connections are crucial to the SAS of Facebook and Twitter, YouTube's SAS does not necessarily require that type of connectivity. YouTube's homepage includes recommendations and the ability to explore content based on genre or topic. Trends are a good way of discovering content in Twitter and YouTube, as popular topics are tracked and aggregated. YouTube and Twitter both promote the exploration of content, where Facebook is more tightly coupled with a user's social network. Content sharing in the three SNS varies, specifically Twitter and Facebook interactions are posts to the surrounding network. In contrast, the main contribution by users in YouTube is the uploading and sharing of video content; the majority of users' comments concern opinions about videos rather than direct interactions with connections. These comments are open to everyone and are not intended for sharing purposes. Another difference that exists between Twitter and both Facebook and YouTube, is the ability to *view* the content that is shared and discovered within the network. Unlike Facebook and YouTube, Twitter does not enable content to be viewed in the environment but instead is linked to an external source. Tagging also differs in the three SNS. YouTube 'tags' describe the content in a video for searching purposes. In contract with Twitter and Facebook it is not used in comments or posts for linking people and content. Facebook enables users to tag people or pages into photos, posts, places, videos, notes, activities, sports, education and work, etc., creating more relational data. Twitter 'tags' aggregate content into streams of updates and allow people to find content easily and link to that content. Information is propagated across the network with the semantic linking of data and is the main form of discovery (especially in Facebook and Twitter) next to active searching (more relevant to YouTube).

6 Discussion and Conclusions

This research proposes affordances as a useful model for studying SNS and their emergent use for sharing, managing, and discovering content. From the extant literature the existence of six types of affordances was defined. Twenty further sub-types have been delineated from the system investigation within the three SNS. By understanding which features afford particular behaviours, the system inventory can be used in future research to understand user appropriations. What is evident from the findings is that all three SNS share similar capabilities for use in different contexts. The systems seem to be evolving to replicate the features provided by other social networks, whilst supporting diverse use intentions. YouTube is principally a video sharing site, but it also enables most of the features provided by the other SNS. Similarly, Twitter is a micro-blogging tool that has been enhanced through the connections of people and content, and the ability to drill-down into the content and extract relevant information from vast amounts of data. The creation of semantic data through tagging enables people to share and retrieve large amounts of content daily. This emergent use of Twitter has enabled it to be a richer media for finding relevant information and user specific personalisation. Facebook has underlying differences to the other two SNS. It is primarily used for creating links with known connections, but Facebook has begun to create additional ways to add semantic data to content, creating further ties between individual nodes in a network.

All three SNS displayed similar affordances provided by varying features and differing intended purposes. The two families of affordances (social and content) are relevant to the study of SNS by enabling research to view SNS services through their social capability and the capability to manage, share and find content. The study suggests that there is a relationship between the social and content affordances, in particular, the capability to find and connect to other people is important to the success of social network systems and is the foundation of the other SNS affordances: social interactivity, content discovery, content sharing, and content aggregation. Content aggregation is also a crucial feature for discovering and sharing content amongst a network, where content sharing is facilitated by the social interactivity affordance. This finding is in line with past studies of Information Communication Technology (ICT) affordances and the concept of core and tangential (i.e. secondary) affordances (Lee, 2010). In both social and content affordances there are hierarchies of affordances (McGrenere and Ho, 2000) or nested affordances (Gaver, 1991). These hierarchies consist of core

affordances that lead to the optional use of other secondary affordances. For example, the aggregation of content into an SAS is a core affordance of content discovery, and a secondary affordance is the ability to post a reply on content displayed in the SAS. The social and content affordances are also applicable to the eight types of affordances outlined in past studies of traditional communication mediums, such as telephone, video-conferencing, two-way chat, email, and letter (Clark and Brennan, 1991; Olson and Olson, 2000; Lee, 2010). Affordances of SNS differ to those of traditional media where concepts such as: (1) co-presence (same physical environment), (2) visibility (visible to each other), and (3) audibility (speech) are represented differently in the online space of SNS. Social presence is used in SNS to show people are available and willing to connect and engage; it is afforded by social connectivity, social interactivity and profile management. Videos and video messaging are also employed, adding audibility to certain mediums. (4) Contemporality (message received immediately) is addressed in SNS through the use of SAS with constant updating of directed posts and comments, but gives the user control over when the message is viewed. In SNS (5) simultaneity (both speakers can send and receive) and (6) sequentiality (turns cannot get out of sequence) are evident; users can post and receive messages, and it is automatic that sequentiality exists in this online format; especially evident in the posting mechanisms and the use of the chronological SAS. Finally, (7) reviewability (able to review other's messages), and (8) revisability (can revise messages before they are sent) are affordances that also exist in SNS; rating and commenting with opinions is enabled and affords reviewability, while in the online space all original content can be revised prior to posting.

The findings in this study can be used in future research to investigate actual use and emergent behaviours, as well as the factors affecting affordances and the design aspects of SNS. The system inventory has been a necessary step for future investigations of SNS. Although there is an agreed upon definition of these systems, a comprehensive list of features and their affordances does not exist. This study has provided a complete overview of three different types of SNS, all very popular and all with different underlying intentions. These systems share similar affordances within their given contexts and have a wide variety of capabilities, whilst also tailoring to specific user's needs and goals.

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