

**Trend Dynamics:
A Method to Improve the Analysis, Dissemination and Forecasting of Trends on
the Internet**

By

Ernesto Strazza

SUBMITTED TO MIT SLOAN SCHOOL OF MANAGEMENT IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

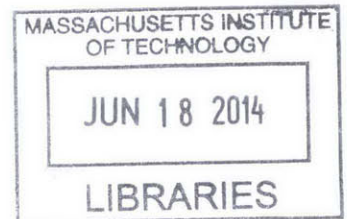
**MASTER OF SCIENCE IN MANAGEMENT OF TECHNOLOGY
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JUNE 2014

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By

Ernesto Strazza

Submitted to MIT Sloan School of Management
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Abstract

This thesis provides a new perspective in trend analysis with the acknowledgement of individuals as carriers of trends and susceptible to influence simultaneously by a trend's perceived significance and by external effects (media, peers, society, etc.), which reshape individuals' trend preferences according to the type, direction, and strength of the stimuli received.

Internet trends are considered as elements that carry knowledge that can provoke a shift in actors' behavior, altering their preferences to a new direction because they affect individuals' values and beliefs. If trends can change individuals' behavior and conduct, and later, their preference progression, trends also have the capability to accumulate information on what individuals care about, how their inclinations have changed and towards which new interests they are moving. If products and services have specific aspects that trigger selections of the same products and services by unrelated individuals, this will denote the presence of a unique feature or set of features that acts as a gateway of contact. This work proposes the elaboration of actors' and products' networks to be implemented within Internet systems, to improve current technology that captures and displays users' preference evolution and potential trend formations; since people leave traces of their historic behavior, enabling the observance of relations between their current social and product networks, the newly entered and the ones left behind. Each consecutive preferred product contains information of a new assessment of individuals, expressing further necessities, values, aspirations, and desires. If several individuals point to the same products and services, those similar products and services will be the connection element increasing individuals' level of correlation in relation to the amount of products matched. Moreover, if a trend triggers a new preference, the progression of preferences will contain the sequence of drives and external effects or rather, the record of cultural elements that were involved; information that could be used to forecast the probability of positive reactions towards the trend by other similar individuals who were not following it. Because a trend travels through followers, each follower will be part of a *virtual* network outlined and materialized by the products and services chosen by them.

This thesis suggest the idea that a trend is evidenced through the spontaneous sequence of detection, routing and preference from differentiated actors towards the same product or service, because that concordance shows the existence of a broadly valued aspect and a common-connector element that provokes preference agreements among isolated individuals despite their dissimilarities, allowing Web-based companies to develop and observe social-products networks to understand which trends and features have the potential to be successful, which phenomena are affecting preferences and which remaining users are susceptible to increase the diffusion of the trend.

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1. Introduction: Trend Concept

A trend refers to the course, tendency or direction towards which something tends to move. It could be represented by an idea, concept, news, event, image, video, product, technology, behavior, conduct, belief or any social expression.¹ A trend implies that an already existent or new element will gain increased relevance, generate attention, be recognized as a tendency or, eventually, dominate within a certain group or network, generating attraction and gradually becoming a reference that shapes the preferences, interests, and later on, the identity of individuals. If it is successful, the evolution of a trend inside a network will generate progressive acceptance, attraction or understanding of the new or existent element that generates the trend, creating dynamic knowledge and cultural standards.

A trend has an origin, caused by any source that shows, initiates or proposes an event, an unobserved aspect of an element, a new concept, mechanism or device able to potentially alter or attract individuals.

A strong trend tends to spawn a cultural effect adding or substituting new information inside a network. That information could change individuals' conduct or act as a new paradigm that will build the bases from which future trends will develop. A trend has the potential to influence, switch and redirect societal ideas, or add new concepts, values and paradigms to a network. A cultural trend may be the result of multiple influences and external sources, derived from the primary social fundamentals by which society is defined.

2. Influence

An external cultural source, from which cultural trends can be generated, corresponds to a concept, standard or information that has the potential to affect individuals' preconceptions and preferences because of the complementation or substitution of the pre-established knowledge by the new information received.

Any cultural expression—music, movies, literature, theater, and others—can generate a new trend through the influence over any of the *early adopters* who didn't consider the external influence as a negative element, recognizing and accepting its value or attractiveness. Media and the Internet affect the values and beliefs of a culture system. New identity proposals, social behaviors, ideological concepts, morals, ethics and human conduct could be transferred from one individual to another as a novelty, a contradictory or reinforced idea.

The evolution of a trend inside a *peer* network, represented for example by a new product that is being gradually chosen by the *early adopters* and *innovators* from that network can signal to others, potential followers, that the *new* element could be a remarkable one because someone who has similarities or common *homophily*² factors has accepted it.

¹ "The American Heritage" (2000). Dictionary of the English Language, Fourth Edition, Boston: Houghton Mifflin, updated on 2009.

² Tendency of individuals to associate and bond with similar others; these include age, gender, class, and organizational role. Source: Wikipedia: Homophily, <http://en.wikipedia.org/wiki/Homophily>, updated on April 2014.

Lifestyle trends, represented through everyday spread information such as advertising and media content, trigger permanent transformations and affirmations of individuals' identity, which evolve progressively across time in relation to the stimuli received. Individuals accept new concepts and values according to their ideological tolerance, which can be compatible with the new proposition or not, and assume an idea, concept or product in their daily lives if it not outside their dynamically defined tolerance threshold.

A first *contemplative* act of an individual towards an aspirationally established paradigmatic concept or influence can potentially be added to the individual's existence and may contribute to the individual sense of desired selfhood.³

A pervasive trend sets a new potential canon or standard within the influenced network, altering its internal preferences, concerns, values and cultural equilibriums. Any cultural element that challenges paradigms has an opportunity to redesign the principles that support the identity of the network and therefore reshape the scope of individuals' preferences. For example, media could suggest a new beauty standard related to a skinnier body as the right model to be desired; followers and adaptors of the set canon will generate an imbalance or pressure upon those non-adaptors and therefore the first one will define the standard to be achieved. Non-adopters must make the decision to follow and match the new reference or stay in the same state and let adaptors be different until the peer pressure reaches a strength that establish the new physical appearance as a collectively accepted and desired trend that will set a new paradigm associated with something perceived as better.

Influences dynamics between different levels of aggregation

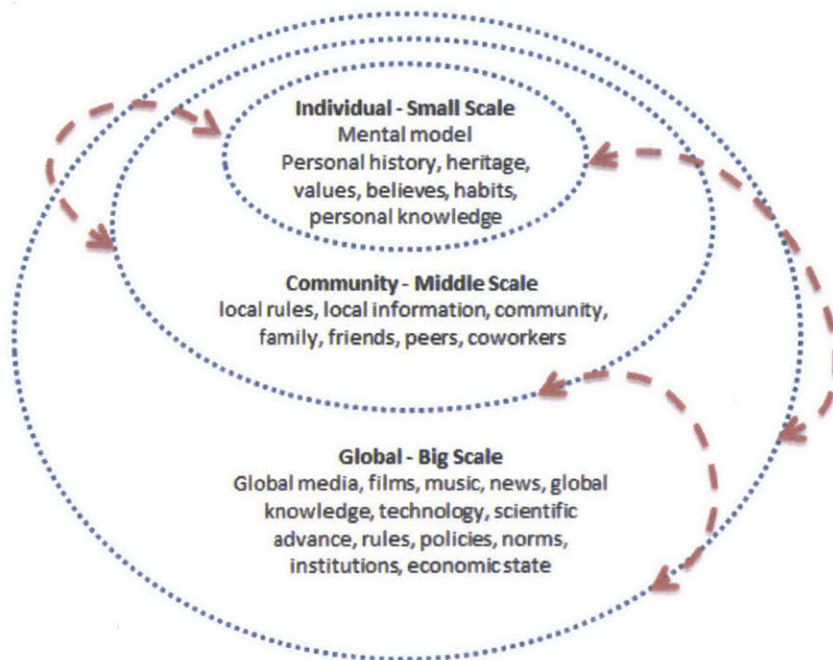


Diagram modified from: Mathematical Models in Gerontology, Source: *Medscape.com*

³ Kellner, Douglas and Best, Steven (June 2001). "The Postmodern Adventure: Science, Technology, and Cultural Studies at the Third Millennium." Guilford.

3. Trend Formation

The perceived contribution and imminence of the potential trend element will predispose individuals regarding a potential trend in its early stage. The emotional impact and cultural understanding will establish then the later success of the trend, defining its assimilation and dissemination within the affected network where the trend is propagated through sharing and recommendation by users.

Each new trend has a unique set of particularities that provoke an agreement that is consciously or unconsciously recognized by the adopters, who are gradually indoctrinated from the level of connectivity and proximity with other users who follow the trend, and also, due to their structural access to it.

For example, YouTube trends have two main indicators: *most viewed and most shared videos*⁴. Both reveal different behaviors of users; the first one is related to the strength of the distribution established by the amount of exposition that a certain video has due to, for example, the amount of advertising frequency delivered; the second is directly related to the recognized impact that the content produces in some users and their appreciation expressed by a referencing action on their behalf to other individuals.

A high distribution can be realized with a high amount of paid exposition. Additionally, a widespread trend based just on direct delivery even though can be highly viewed at the beginning; it will tend to have a low permanency if no other elements make it striking.

A shared successful distribution relies on a significant viral dissemination that has a bottom-up circulation that matches individuals' interests or concerns, a progressive and deep form of communication that has the highest degree of acceptance due the voluntary uptake and consent). The individual observes, watches and recognizes a valuable aspect and then shares it with others to let them know some significant or interesting facet of it.

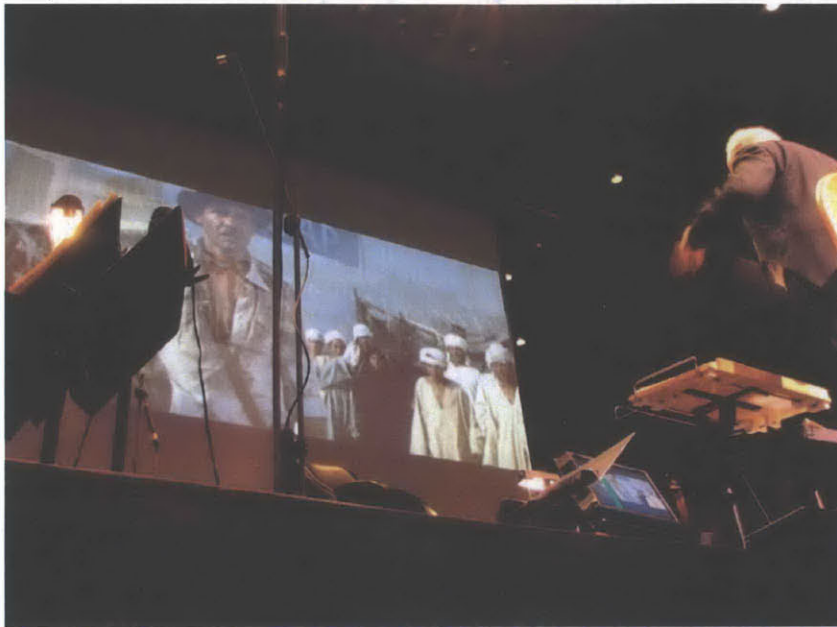
The uppermost achievement of a trend is to provoke attraction towards the proposed element, a gradual sympathy that could evolve into a strong acceptance with a lasting impact that could turn into to a relevant standard for the followers and a significant benchmark for the non-adopters.

A further implication of a transformational message of a potential cultural trend could lead to the complementation, replacement or even elimination of behaviors, previous beliefs, values or cultural foundations. The new embedded and established paradigms are able to reshape the identity of individuals and direct them towards new needs, expressed in novel preferences that intend to seek valuables experiences.

The more universal the attributes of a trend, the higher the scope of distribution among differentiated networks will be. The use of essential and widely understood languages reinforces the transference of the information and increase the perceived conformity of the

⁴ YouTube Trends dashboard, source: <http://www.youtube.com/trendsdashboard>, updated on January 2014.

message, in order to increase and facilitate the delivery of the message. For example, in films, directors amplify the impact of a scene by aligning it with specific music to deliver content more effectively and deeply.



Film composer and director John Williams conducting the score "Raiders of the Lost Ark" in the Avery Fisher Hall

Source: Wikipedia, Transferred from Wikipedia to Commons by Mutter Erde.

4. Trend Communication

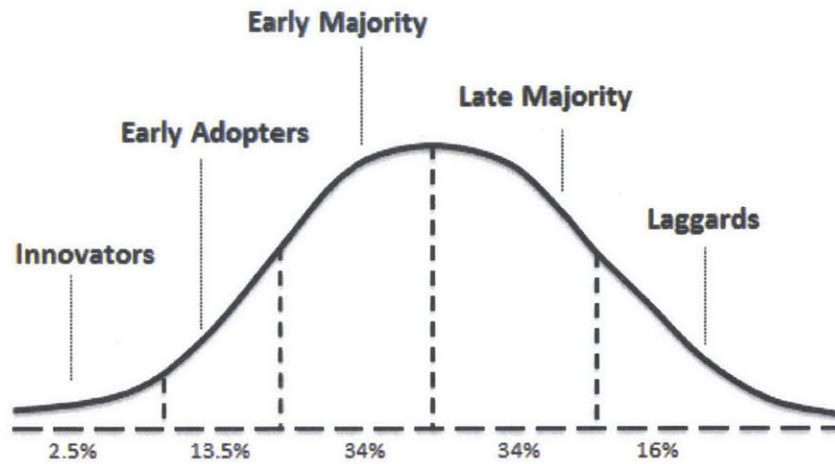
In the Everett M. Rogers' model of Diffusion of Innovations (1962), an *early adopter* or *trendsetter*⁵ is an individual who accepts, assimilates and potentially appropriates a certain idea, fashion proposal, technology, product, religious or political concept, art, or any conceptual current or external element. The diffusion model considers a set of individuals in which the trend enters. The sequence of adopters starts with one or a small portion of discoverers and then a series of subgroups that generate the subsequent dispersion of the trend.

A traditional marketing strategy that looks to place a new product in a certain market tries to push and distribute a trend in order to observe the first supporters and so identify the *innovators* and *early adopters* of the *innovation adoption lifecycle*, because a trend increases its chances of being diffused if it is accepted, understood, assimilated and shared by them to the rest of the network.

The presumption is that *innovators* and *early adopters* will act as explicit or implicit leaders who will be followed for two main reasons: their favorable location within a network which allows

⁵ Source: Rogers, E. M. (2003). "Diffusion of innovations" (5th edition). New York, NY.

an effective communication of knowledge and their motivation that will provoke a contagious or viral effect unfolding on the rest of the network's individuals.



Rogers' bell curve: Innovation Adoption Lifecycle
 Source: Rogers, E. M. (2003). Diffusion of innovations (5th edition). New York, NY.

In terms of knowledge exchange, a network has actors, nodes, and vertices or points that have more favorable positions than others. Figure 1 below shows the *centrality measures* that explain the communication dynamics between actors within the network. The actor "s" has the highest "Degree Centrality" because it has more ties than any other actor. If a trend reaches that node, the amount of potential communications to other nodes will be the highest, reaching 7 other points in a simultaneous *pathway iteration*.

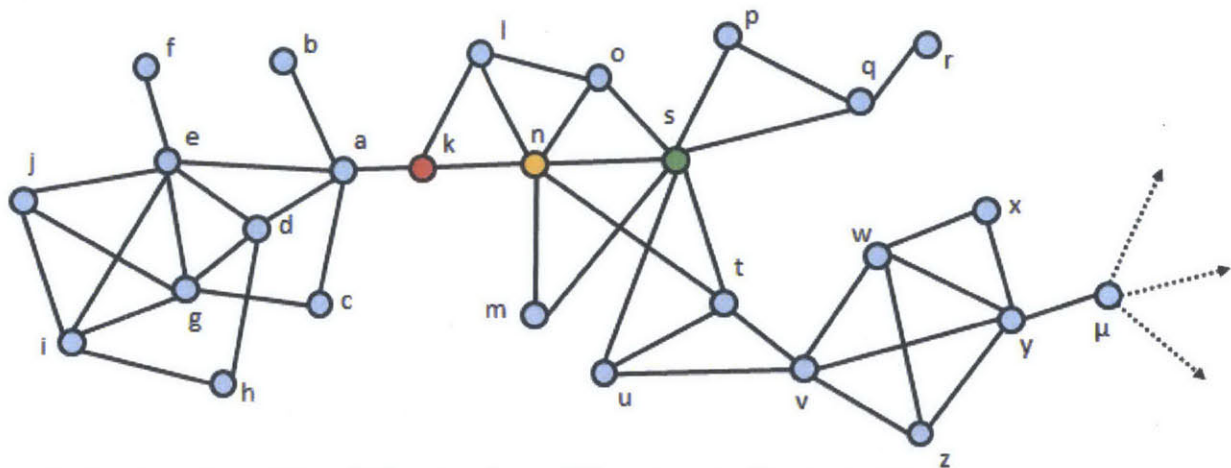


Figure 1. A network graph in which actors have different centrality measures

In terms of the optimal rate distribution of a trend, and considering ties as same-time paths, the fastest way to spread the information will be by reaching the node "n" because it has the highest "Closeness Centrality," or in other terms is the closest point to all other individuals that

belongs to the same network. If the time of each path were measured in seconds, a trend delivered sequentially from actor “n” would take 69 seconds to be spread to all actors of the network, even faster than “s” that takes 77 seconds as shown in Table 1 below.

Table 1. Time that takes for a trend located in nodes n, s, k and l to reach all other nodes (in seconds)

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	μ	Total (t)
n	2	3	3	3	3	4	4	4	5	4	1	1	1	0	1	2	2	3	1	1	2	2	3	4	3	3	4	69
s	3	4	4	4	4	5	5	5	6	5	2	2	1	1	1	1	1	2	0	1	1	2	3	4	3	3	4	77
k	1	2	2	2	2	3	3	3	5	0	1	1	2	1	2	3	3	4	2	2	3	3	4	5	4	4	5	72
l	2	3	3	3	3	4	4	4	5	4	1	0	2	1	1	3	3	4	2	3	3	3	4	5	4	4	5	83

In terms of the how well the information flows, the actor “k” is the most relevant of the whole network due its strategic position. It has the highest “Betweenness Centrality.” If the node decides to block a trend that comes from its right side, showed in the Figure 1, ten actors will not receive the information; consequently, in terms of distribution, although nodes “s” and “n” play central roles in the distribution, “k” has the highest degree of control of the knowledge diffusion within the network.

4.1 Bypassing

Nodes “n” and “s” can be bypassed if they are not originally driven by the trend. If “n” blocks a trend that came from the left side (in Figure 1), “k” can pass it through “l” and then the trend will be shared to subsequent nodes without affecting the overall distribution of the knowledge. Although “s” has control on the information that potentially can reach “q,” “p” and “r,” are “a” and “v” the nodes that control the majority of the knowledge access within the network.

5. Distribution and spread

As explained, two general ways to spread a trend is through direct distribution and sharing. Usually, a certain node will be able to receive the information simultaneously from different sources and therefore the access might not be affected by a sequential distribution or by an actor blockage. However, despite the fact that information has been highly accessible since the Internet era began, a new standard or disruptive information must be understood by the non-follower actors in order to carry on the spreading sequence of a trend, and therefore, several effects exerted by the followers play an important role in terms of predisposition and behavior change of others, permitting a further distribution of a trend.

If a certain actor receives the influence of one or more individuals, a potential “network effect” will be low compared with the influence from multiple actors at the same time. The perception that the majority is accepting or agreeing with the new trend will increase the probability of expanding the number of followers; accordingly, if a blocked actor receives a trend from an external distribution source, the persuasion effect strength coming from the network is low because the individual does not have visibility of the volume of followers of that network; therefore the number of bypass ties facilitates network effect dynamics being the “Betweenness Centrality” a relevant indicator of the persuasion potential of a network signaling the existence

of available space for the followers to exert their influence upon the non-followers of a network.

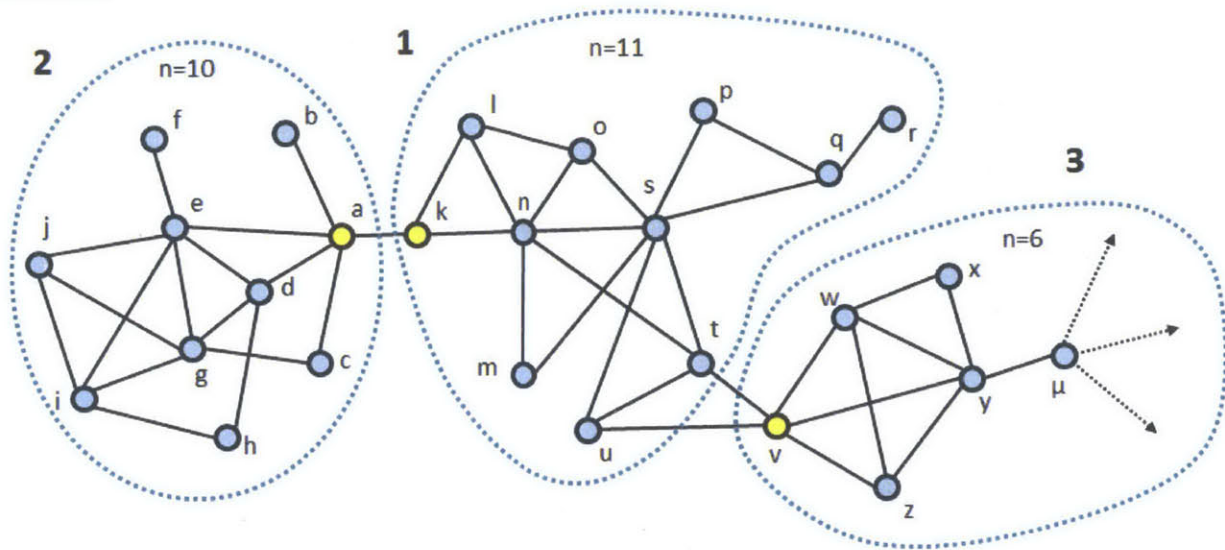


Figure 2. A network graph that contains three groups

The sharing act is an effective and relevant influence due the fact that knowledge that is received and then distributed has a tangible and potentially shareable attraction value for the node that transfers the information.

In Figure 2 above, there are three groups that are differentiated, 1, 2 and 3. Each one has a different number of nodes connected among them by actors “a,” “k” and “v”, each of which has a high “Betweenness Centrality” that can define the information flow between the three groups. If a trend came from group 2 and reaches node “a,” group 1 depends on node “a” to access the trend. If the trend is understood and possesses a significant aspect for “a” that motivates it to share the knowledge received, the information will be shared; the same applies to “k” in relation to group 1, and so on.

If “k” does not have the empathy, cultural agreement or understanding required to value the trend then the influence will be sterile even if the strength of the trend is amplified by an external distribution channel. For example, if group 2 represents a group that speaks a unique language within the entire network and the trend is in their language to be understood, group 1 will not receive the information and therefore the trend will be kept inside group 2.

If the trend is able to be understood and there are no other cultural barriers, the influence effect of peers and social networks will be critical if the trends lacks perceived attractiveness.

Distribution requires the intermediate action of individuals that act as a bridge between individuals in order to communicate knowledge, demonstrating interest, value recognition and mutual understanding; therefore, an actor that sends the information to others is implicitly recognizing that the destination will agree or understand the substance contained.

There are several aspects that are relevant during the spreading sequence of a trend:

5.1 Origin and Direction: The origin shows the channel, node or networks from where the trend initiates. The start is usually recognized earlier by *innovators* and *early adopters* who identify the significance and then decide to share the information with others. The direction, as shown in Figure 3, is towards where trends could possibly move, and reveal the subjacent understanding and similarity that the *innovators* and *early adopters* have with the subsequent nodes.

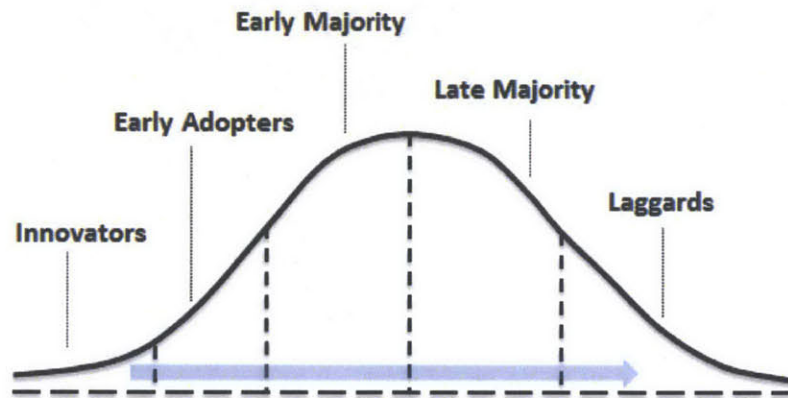


Figure 3. The origin and direction of trends on a Rogers' bell curve

5.2 Simultaneity is the simultaneous response of differentiated networks expressed by a coincident interest in the trend. An overall agreement occurs due to the identification, understanding and assimilation of the trend across separated and unintegrated networks, as shown in Figure 4.

A trend acquired simultaneously by actors from different groups has *simultaneity*; a signal that a trend has multi-cultural acceptance. The trend is understood because retains the elements needed to generate a universal common empathy caused by its perceived desired attributes.

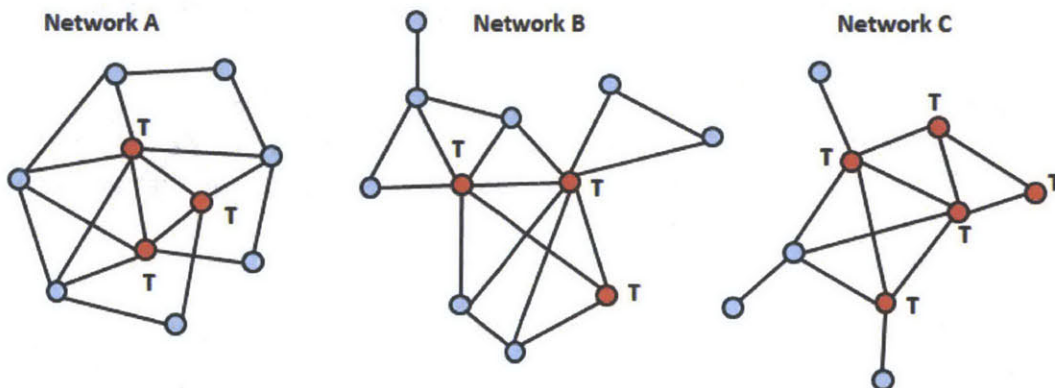


Figure 4. Actors from three differentiated networks follow the same trend, T = Actor that follows the trend "T"

5.3 Convergence is the level of similarity that exists between network types where the trend has successfully entered. A network type could be a corporation, a religious group, a political party, a school or any common aspect that identify a network.

Figure 5 shows that the trend (T) converges across networks characterized as type “X,” but not across those of type “Y.”

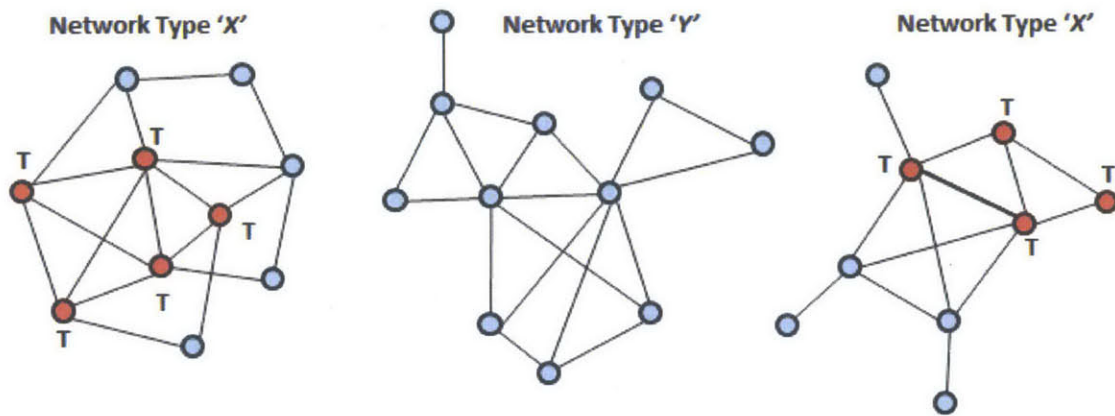


Figure 5. Two out of three networks follow the same trend. T = Node that follows the trend “T”

5.4 Threshold is the sufficient number of followers that a potential element generates in a defined network in order to be considered a trend in relation to the number of actors that configure the network. Correspond to the relative number of nodes that become followers in relation to the non-adopter individuals.

5.5 Velocity is the rate of distribution of a trend within a network, depending upon the network and the trend properties.

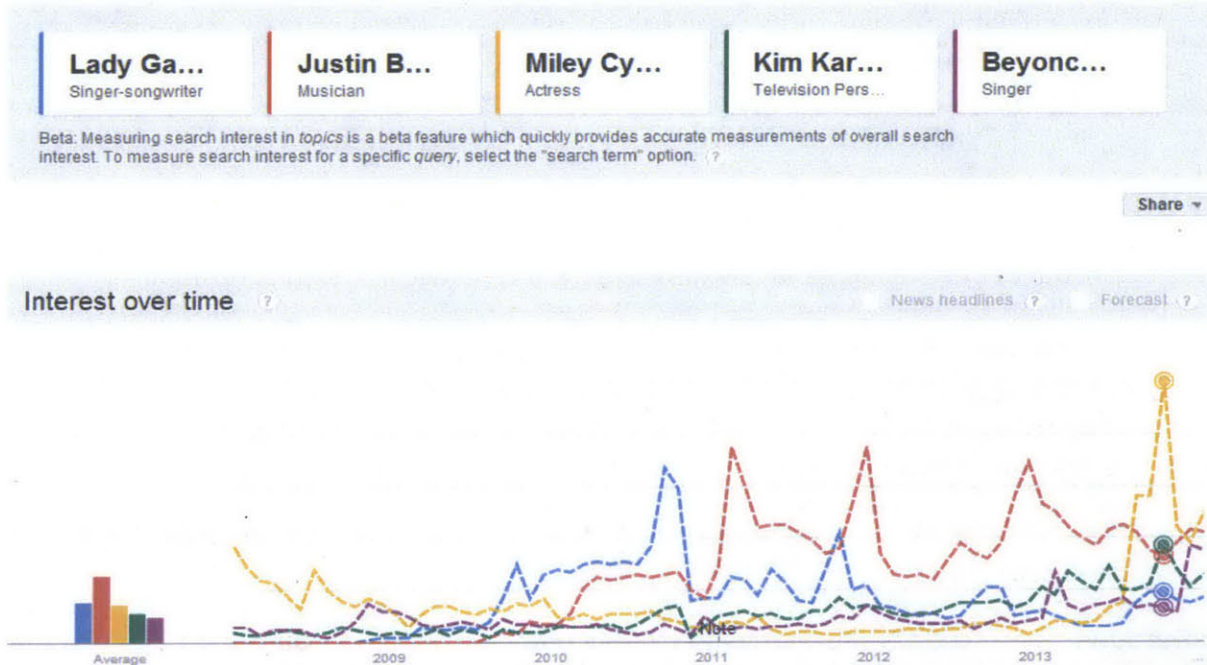
5.6 Duration is the time a trend lasts within a network. A *Fad* is a short duration trend that has few strength elements to sustain it, and therefore is abandoned quickly and replaced by another fad or trend.

6. Singularity⁶

A singularity is the distinctive unique or clustered set of attributes of an element that generates a trend. It is the most relevant characteristic since it is the aspect that **generates the pull effect** that provokes attention and expectation, keeping a trend valid or active within a network. The concept *active singularity* refers to the strength and durability of the unique attributes that keep the attraction alive. A trend with a low active *singularity* could have a reduced life and therefore would be considered only a *Fad*. From the standpoint of the followers, a trend that contains singularity is distinguished by its exceptional and perceived attraction that keeps the trend legitimate. Singularity is the way to achieve differentiation and avoid not being noticed in a saturated network.

⁶ It is proposed an alternative definition of the word “Singularity” from the concepts found in the online dictionary *Wiktionary*, source: <http://en.wiktionary.org/wiki/singularity>, updated on April 2014.

Some examples of active singularity could be observed in areas where media, design, arts or any cultural and qualitative constituents are presented. For example, in show business, some singers and actors use several methods to reinforce their popularity, gain attention and developing a unique position in an overcrowded and competitive environment. Several escalating ways to catch public attention and sustain recognition include the use of unconventional fashion designs, odd behavior or recurrent controversial actions to produce frequent impactful news about their lifestyle and generates remembrance from desensitized audiences exposed to recurrent similar stimulus.



Keeping the attention alive through time; the chart above shows the interest over time in Lady Gaga, Justin Bieber, Miley Cyrus, and others show business actors from 2009 to 2013; line peaks correspond to events and controversies.

Source: Trends Graphs, from Google Trends.

<http://www.google.com/trends/>

In a saturated and competitive space, the incentives for individuals to differentiate and develop or become a trend will escalate the intensity of the differentiator aspects in order to catch more attention. The overall outcomes will be the use of increased degrees of unusual and disruptive tactics to produce impact and create the perception in others of uniqueness.

Lady Gaga "Rides a Horse" on AMAs 2013 Red Carpet.

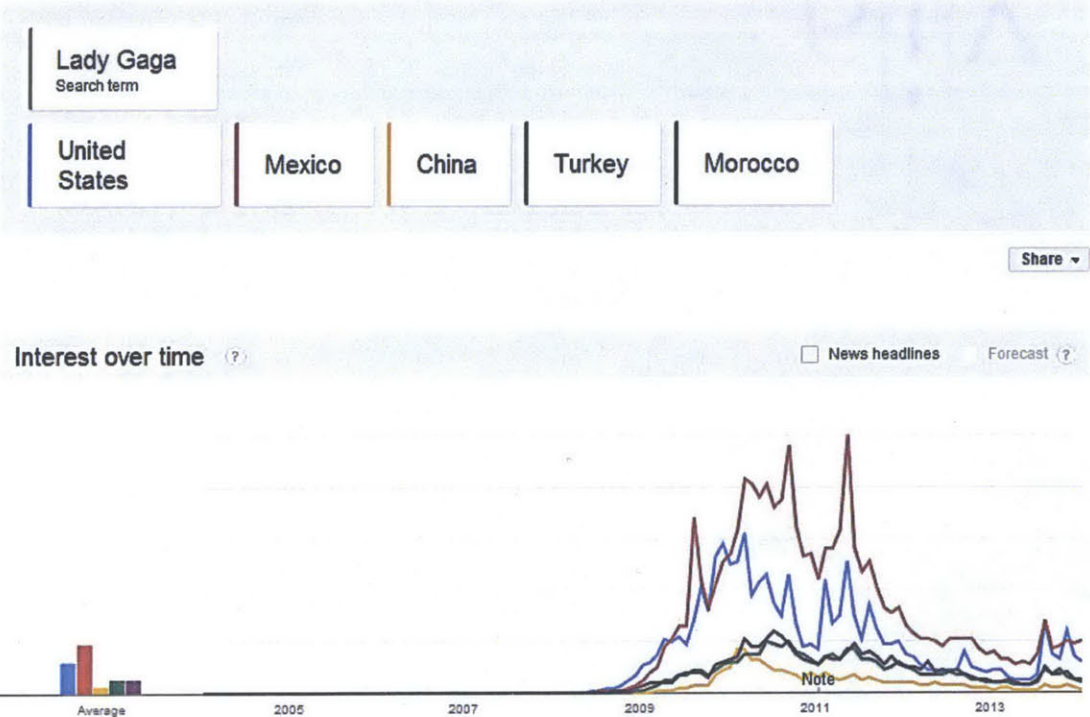
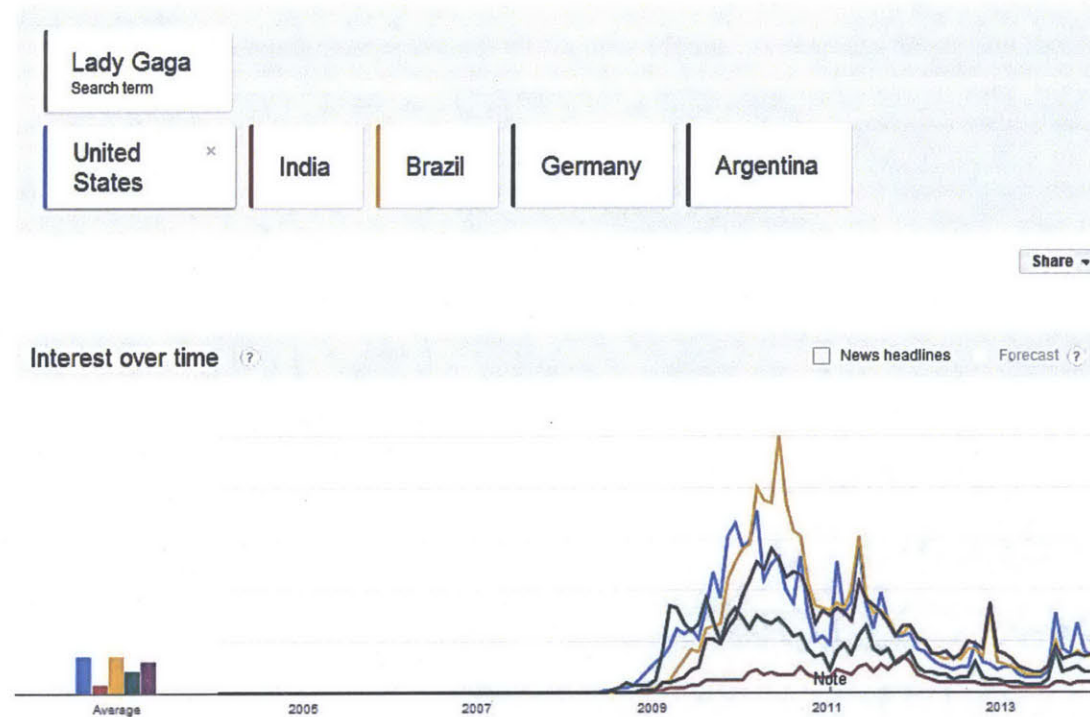
© <http://www.justjared.com>



Popularity can be reached across several countries if the sequence of performances executed and proposals presented are collectively understood, but also, appeal and impact different cultures, as can be seen in the following charts:

Interest over time about "Lady Gaga" across several countries, from 2005 to 2013

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>



Lady Gaga
Search term

United States

United Kingdom

Canada

Australia

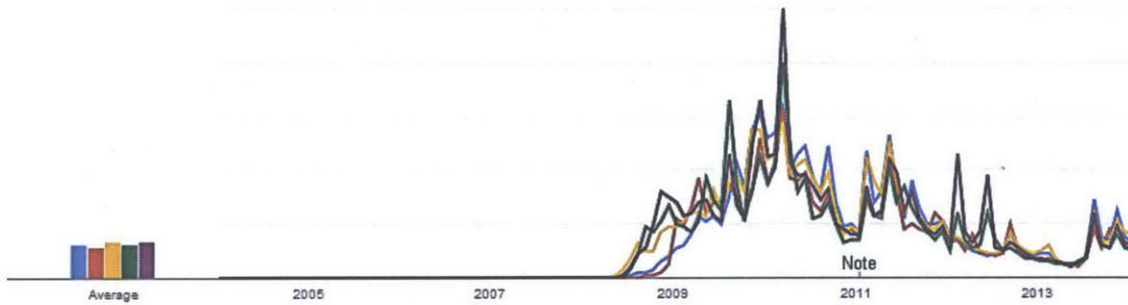
New Zealand

Share ▾

Interest over time ?

News headlines

Forecast ?



Interest about South Korean singer "PSY" across several countries

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>

Topics	Top		Rising		Queries	Top		Rising	
	Value	Bar	Value	Bar		Value	Bar	Value	Bar
Gangnam Style - Song - Psy	100	<div style="width: 100%;"></div>			psy	100	<div style="width: 100%;"></div>		
Gangnam Style - Song	15	<div style="width: 15%;"></div>			gangnam style psy	100	<div style="width: 100%;"></div>		
Psy - Singer-songwriter	10	<div style="width: 10%;"></div>			psy gangnam	100	<div style="width: 100%;"></div>		
					lyrics gangnam style	85	<div style="width: 85%;"></div>		
					youtube gangnam style	80	<div style="width: 80%;"></div>		
					oppa	70	<div style="width: 70%;"></div>		
					oppa gangnam style	65	<div style="width: 65%;"></div>		

Regional interest ?



Region City	Value	Bar
Vietnam	100	<div style="width: 100%;"></div>
Mongolia	54	<div style="width: 54%;"></div>
Cambodia	43	<div style="width: 43%;"></div>
Turkey	38	<div style="width: 38%;"></div>
Azerbaijan	37	<div style="width: 37%;"></div>
Sri Lanka	35	<div style="width: 35%;"></div>
Malaysia	33	<div style="width: 33%;"></div>

7. Trends Properties

7.1 Genre Scope

Reveals the position of the trend inside a category field; it is the classification or style definition of a trend, the achieved place shown through its specific contained features. A trend is located in the genre space from the combination of setters that define the elements that shape it. As shown in *Figure 6*, the Genre Scope includes:

7.1.1 **Evolution** is the level of change that the trend has had from its original and pure state to a transmuted and eclectic phase.

7.1.2 **Density** is the number of features and elements that compose a trend, from a simple one with few elements to a complex trend with several components.

7.1.3 **Edge** is the level of sophistication, measured as the distance from an established proposal or classic style to a more vanguard and therefore scarcer tender.

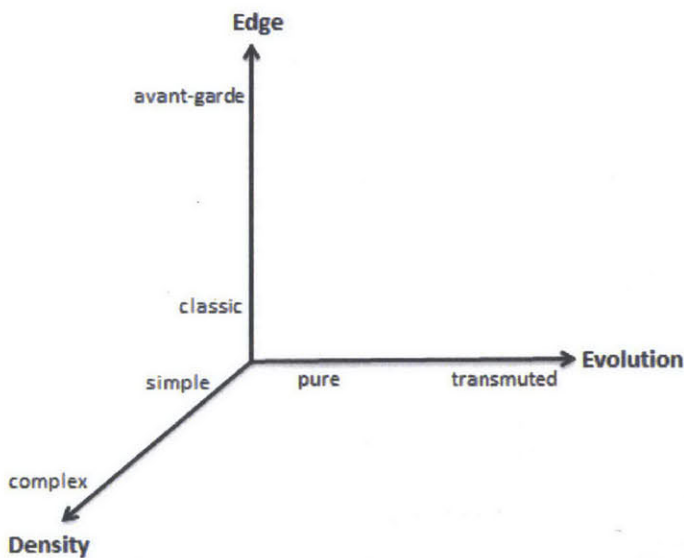


Figure 6. The relation between the factors of "Genre Scope" expressed in a three axis graph

The following images illustrate some examples of *Genre Scope* placements applied from fashion and music trends that have a *transmuted Evolution*, *mild Density* and *moderate Edge*:

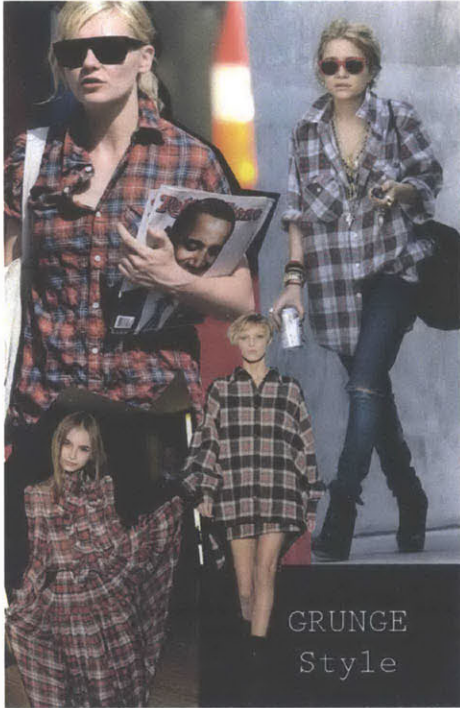


Above: Kurt Cobain during 1992; one of the main sources and influence of “Grunge” style on music and fashion.

Source: <http://www.collegefashion.net/inspiration/stylish-men-fashion-inspired-by-kurt-cobain/>



Above: a band influenced by “Grunge” style during 1993, keeps the *Evolution* factor pure.
4 Non Blondes Band, 1993, Source: <http://www.last.fm/music/4+Non+Blondes/+images/392016>



Above: fashion trends during 2008. "Grunge style returns", changing the *Density* factor to a simpler state and *Edge* factor to a more classic proposal.

Source: <http://www.styleforstyle.it/trend-alert-moda-2008-grunge-style/1634/>



Above: Contemporary Grunge Style and Neo-grunge looks.

Runway at Dries Van Noten S/S 2013, Source: <http://www.fashionising.com/trends/b--grunge-fashion-grunge-style-50876.html>

7.2 Context

The context is where the trend is located. Depending on its extent, it can be a small group, a bigger network or even worldwide. A new trend can compete with other proposals or may be distinguished by its novelty; likewise instead of competing, it could use other trends to amplify its effects because of complementary activities that promote the spread and increase its acceptance. *Figure 7*

7.2.1 Desaturation: The lack of potential substitutes, opponents, or rivals.

7.2.2 Expansion: Is the presence and tendency of supporting related elements, complementors or reinforcing trends; if they are growing and gaining popularity or contracting and losing preponderance.

7.2.3 Conditions: The network context conditions relevant for a trend to exist and develops: cultural, political, economic, social, educational, among others; correspondingly, the values, beliefs, behaviors, conducts and standards that define individuals' position regarding the trend, provoking their agreement or disagreement concerning it.

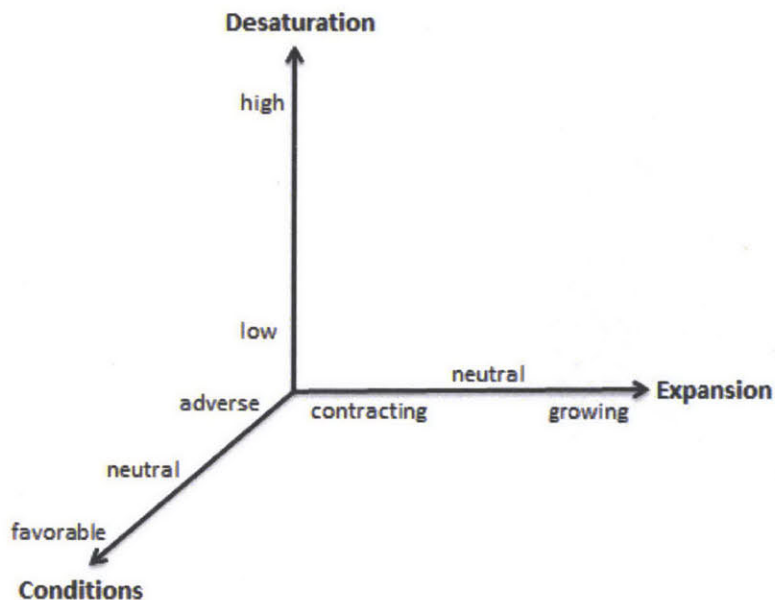


Figure 7. The relation between the factors of "Context" expressed in a three axis graph

The *Context* describes the setting for a new or pre-established ideological, cultural, conceptual, social or instrumental pre-existent element or proposal; the following are some examples:

Popularity of Pope Francis during 2013 by country

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>

Regional interest ?



Region City	Interest Score
Uganda	100
Nigeria	61
Malta	52
Philippines	48
Ghana	41
Kenya	34
Ireland	31

Popularity of God during 2013 by country

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>



Swaziland	100
Ghana	96
Eritrea	91
Nigeria	90
Philippines	80
St. Vincent & Grenadines	79
Malawi	77

Popularity of God during 2013 by city

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>



Manila	100
Makati City	84
Atlanta	53
Pune	51
Dallas	51
Bangalore	50
Houston	48

Popularity of Jesus during 2013 by country

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>



Eritrea	100
Guatemala	86
Nicaragua	78
Honduras	73
Peru	68
El Salvador	67
Haiti	67

Interest over time of search terms: "God, Christ, Jesus, Happy and Money" from 2005 to 2013

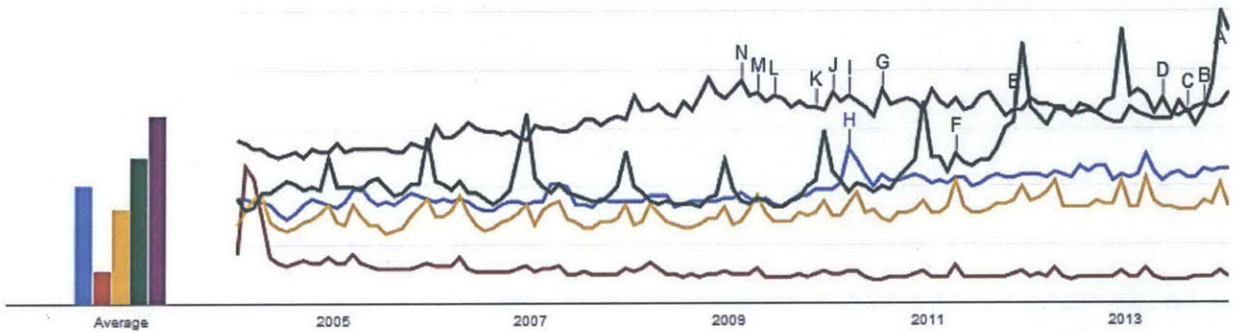
Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>



Share ▾

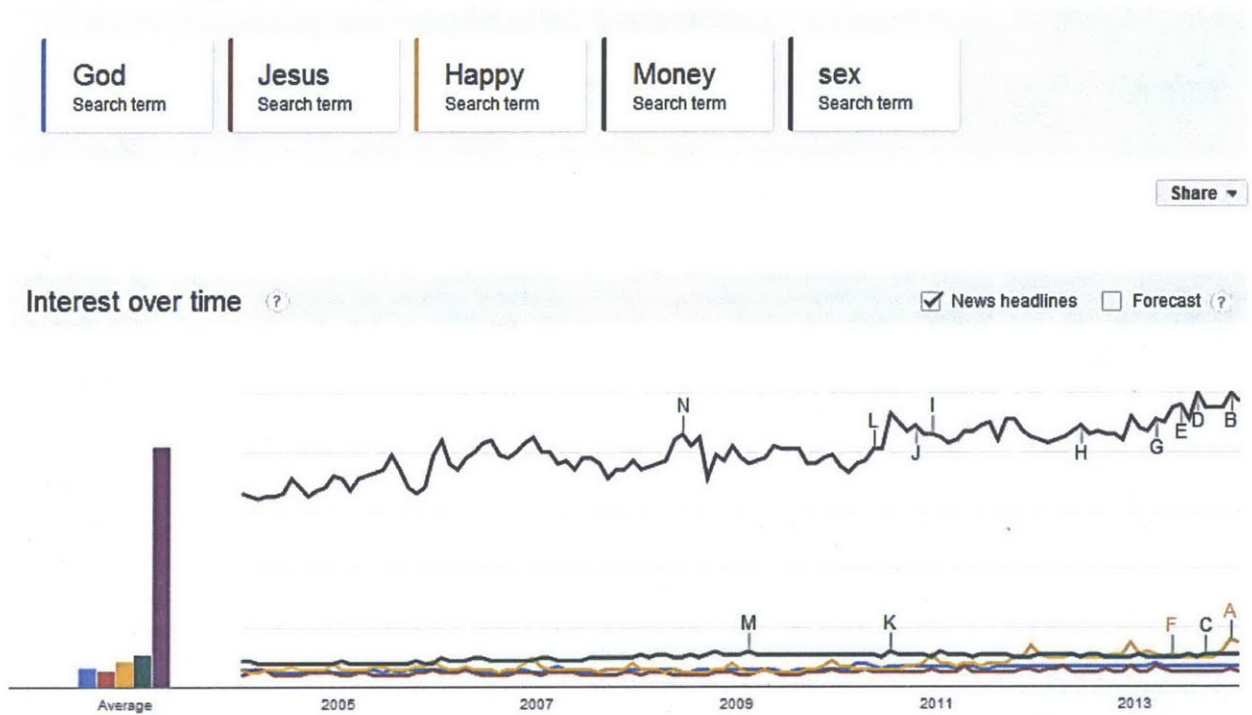
Interest over time ?

News headlines Forecast ?



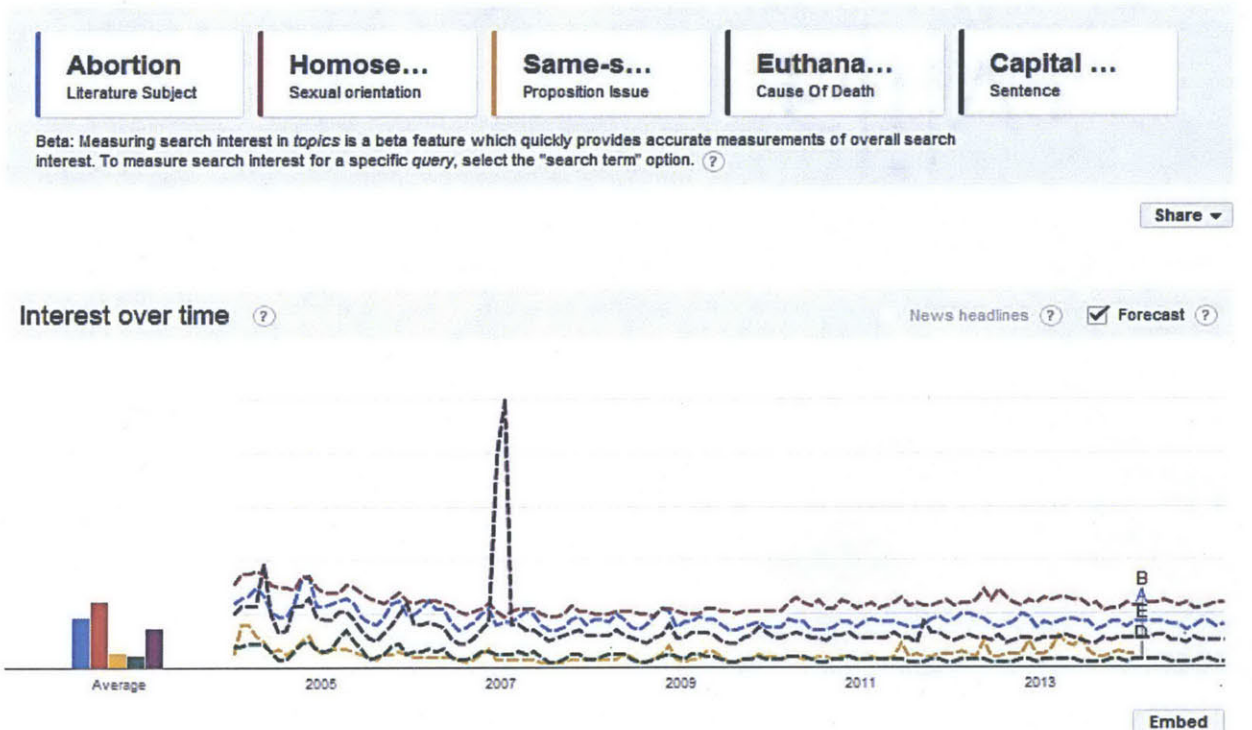
Interest over time of search terms: "God, Jesus, Happy Money and sex" from 2005 to 2013

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>



Interest over time of search terms: "Abortion, Homosexuality, Same-sex marriage and Capital punishment" from 2005 to 2013

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>

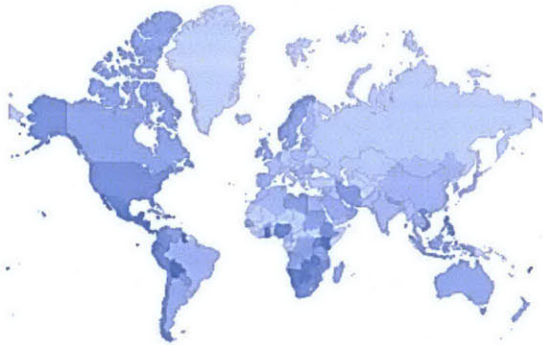


Regional Interest sequence of: "Abortion, Homosexuality, Same-sex marriage and Capital punishment" during 2013

Source: Trends Graphs, from Google Trends., <http://www.google.com/trends/>

Regional interest ?

Abortion Homosexuality Same-sex marriage Euthanasia Capital punishment



Region City	Interest Score
Bolivia	100
Belize	96
Guyana	88
Kenya	86
Botswana	85
Ghana	77
Nicaragua	76

Regional interest ?

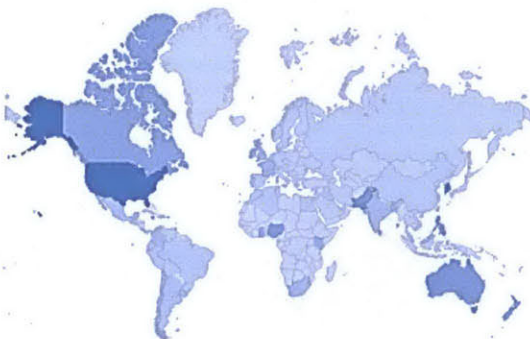
Abortion Homosexuality Same-sex marriage Euthanasia Capital punishment



Region City	Interest Score
Vietnam	100
Chile	70
Haiti	65
Hungary	61
Gabon	57
Cameroon	53
Benin	49

Regional interest ?

Abortion Homosexuality Same-sex marri... Euthanasia Capital punishment



Region City	Interest Score
United States	100
South Korea	88
Australia	53
Pakistan	50
Jamaica	48
Nigeria	47
Philippines	46

Regional interest ?

Abortion Homosexuality Same-sex marriage Euthanasia Capital punishment



	Region City	
Mauritius	100	<div style="width: 100%;"></div>
Puerto Rico	73	<div style="width: 73%;"></div>
Philippines	65	<div style="width: 65%;"></div>
Lebanon	64	<div style="width: 64%;"></div>
Colombia	62	<div style="width: 62%;"></div>
Mexico	62	<div style="width: 62%;"></div>
Netherlands	57	<div style="width: 57%;"></div>

Regional interest ?

Abortion Homosexuality Same-sex marriage Euthanasia Capital punish...



	Region City	
Iran	100	<div style="width: 100%;"></div>
Palestine	100	<div style="width: 100%;"></div>
Iraq	95	<div style="width: 95%;"></div>
Yemen	91	<div style="width: 91%;"></div>
Syria	73	<div style="width: 73%;"></div>
Jordan	69	<div style="width: 69%;"></div>
Kuwait	61	<div style="width: 61%;"></div>

7.3 Impact

A trend has to generate some impact to be considered a durable tendency. If the impact is immediate but does not hold, for example, due to lack of cultural strength and understanding or absence of relevance perceived by the actors, it may have a short life even if it is spread, because it could be easily replaced by another trend that caught people's attention. A saturated and homogeneous *Genre Scope* network with similar trends that increase rivalry without significant differentiation achievements will present a high number of rotating trends.

In order to last, an element should generate attention but also sustain interest through time, adjusting the dialogue with the real needs of society, collective environmental concerns, market preferences, complementary elements, and perceived cultural bearing forces, among others. The factors that define *Impact* are (Figure 8):

7.3.1 Response: Immediate impact. This provides the overall positive or negative perception with different degrees of intensity, alerts the instinct and defines the mood of the reaction: funny, sad, threatened, empathetic, etc.

7.3.2 Identity: Lasting reaction. This is the ideological posture that a trend suggests, the agreement or opposition posture regarding the perceived value presented.

7.3.3 Gap: *Coolness*. This is the meta-expected-value perceived from a trend and its unpredicted potential achievement. The breach provoked by the trend, that promises to fulfill with its value, content, proposition, ideology, design, example, etc. The proposal of the trend matches with the individual's aspiration.

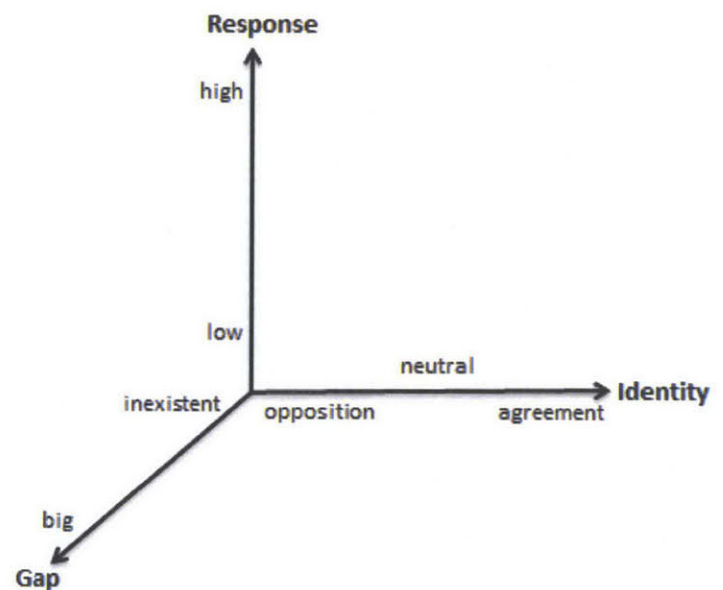


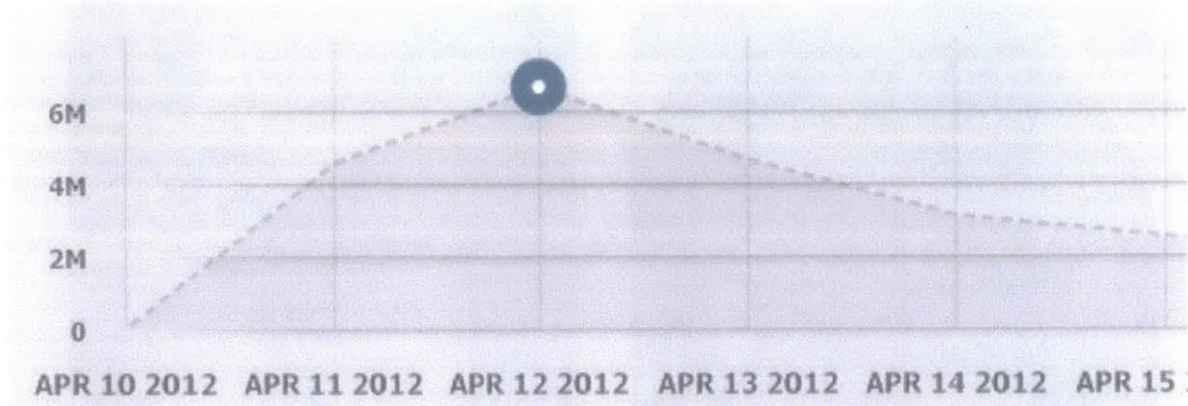
Figure 8. The relation between the factors of "Impact" expressed in a three axis graph

Impact, spectacularity and expectations: TNT campaign

To increase viewers' attention and improve message delivery, the advertising industry uses high-impact content with unpredictable changes to deliver relevant implicit information. Through the use of events that generate spectacularity, viewers empathize with the people involved in the mounting suspense, which maintains their attention and curiosity about the reactions of the individuals involved.

The advertising TNT campaign called "A Dramatic Surprise"; at 24 million views, the creative TNT promotion is the most-viewed, non-music video of early year 2012. The spectacle, which

was staged in Belgium to announce the channel's arrival, became popular around the world, and remained as one of the most-viewed video in numerous countries including South Korea, UAE, Sweden, South Africa, and the United States, among others.⁷



Source: YouTube Trends, <http://youtube-trends.blogspot.com/search?q=tnt&x=0&y=0>



⁷ YouTube Trends Team, April, 2012, "A Dramatic Surprise' is April's Surprise Hit", source: <http://youtube-trends.blogspot.com/>, <http://youtube-trends.blogspot.com/search?q=tnt&x=0&y=0>



Image sequence extracted from the TNT's "A Dramatic Surprise"
Source: YouTube.com, <https://www.youtube.com/watch?v=316AzLYfAzw>

Turn-over valued attributes to increase identification: Dove "Real Beauty Sketches" campaign

Dove's "Real Beauty Sketches" is an advertising campaign based on the divergence between women's perception of their own beauty and others' appreciation of them through the comparison between the faces drawn by an FBI face sketch expert who interprets both descriptions. This campaign is a new approach to women's beauty in contraposition to a highly idealized beauty standard because of which women have enormous pressure to achieve certain physical characteristics imposed by media and society. Instead of establishing an idealistic desired beauty statement, Dove presents an empathic strategy that pretends to transfer to the audience the idea of women's own concern and consciousness about the deepest attributes that are more valuable to them.

The purpose was to increase women's self-esteem by establishing the idea that real beauty relies on their attitude and physical characteristics but is not recognized by them due to a biased self-perception. Dove implies that it does recognize the inner beauty of women and that it does understand how women feel about it.

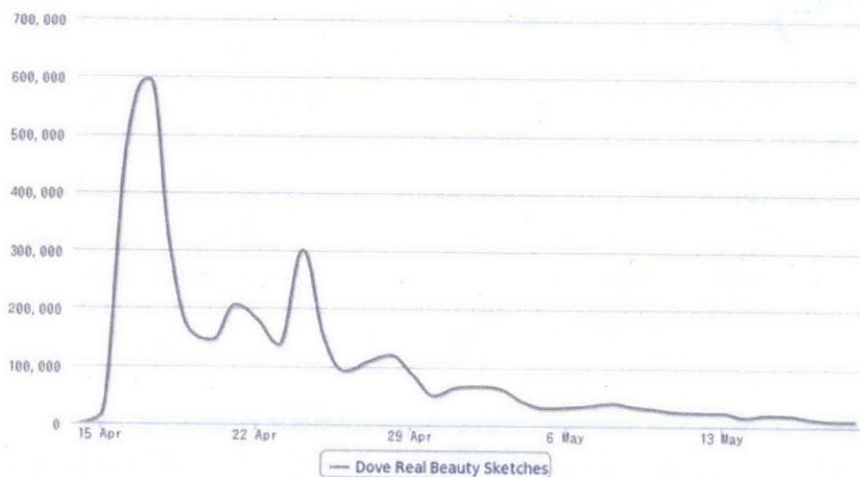
The immediate effect was a high identification with the message, resulting in a high rate of acceptance, views, recommendations and shares.



Image extracted from Dove's "Real Beauty Sketches"

Source: YouTube.com, <https://www.youtube.com/watch?v=litXW91UauE>

Just one month after its release, Dove's "Real Beauty Sketches" had garnered more than 114 million total views, making it the most viral ad video of all time during 2013. A video really soars when consumers don't just want to watch it on YouTube, but they also want to share it with their friends. That's why good content is a key starting point.⁸



Graph of Dove's "Real Beauty Sketches" share statistics in its first month.
Source: Unruly Media

⁸ Stampler, Laura, May, 2013, "How Dove's 'Real Beauty Sketches' Became The Most Viral Video Ad Of All Time", source: <http://www.businessinsider.com/how-doves-real-beauty-sketches-became-the-most-viral-ad-video-of-all-time-2013-5#ixzz30VV15aYK>

According to data, the video was shared 3.74 million times, which makes it the third most shared video of all time of year 2013. And has a better share-to-view ratio (one share for every 30 views) than Evian's "Roller Babies" ad, the previous record holder.⁹



Image extracted from Dove's "Real Beauty Sketches" campaign.
Source: YouTube.com, <https://www.youtube.com/watch?v=litXW91UauE>

The emotional highlight came from women's reaction to the images, realizing that the sketches of them made based on others' descriptions spotlighted traits in a more harmonic and subtle manner revealing a higher beauty than the sketches made base on their own self-descriptions.

Threat and Impact to align and increase collaboration: Tracking the Popularity of "KONY 2012"

The Kony campaign demonstrated the amount of attention and coordination that is possible to be achieve through social media.

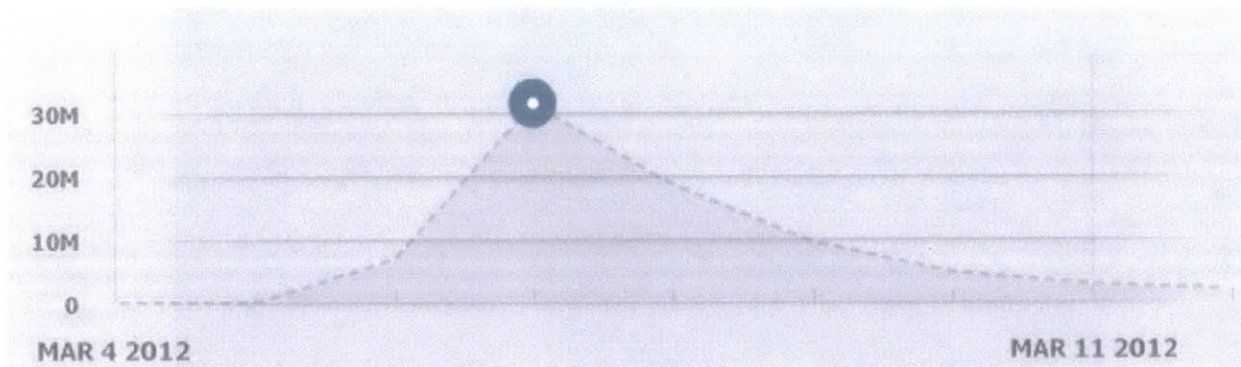
The strength of commitment of its author to uncover the human rights abuse and the identity of the war criminal Joseph Kony in Africa, generated a strong virtual devotion that ended with the promise of the US Senate to send troops help capture him. A significant purpose that affects universal moral and ethical issues has high *response* and high *identity* agreement, generating a big *gap* between the situation presented and the one that is possible and desired.

The campaign brought awareness and commitment using several methods of persuasion broadly sensible to all cultures: it exposed the abuse and use of children, and established a goal and a coordination device based on a collective alliance. The author presented the act of sharing as viewers' contribution to the capture of Joseph Kony before December 31, 2013, accelerating the viral process and avoiding the abdication of followers.

⁹ Ibid

Regardless of the negative effects related to the oversimplification of the conflict and the individualization and exaltation of Joseph, the film revealed the willingness of common people to collaborate and the coordination that is possible if a cause inspires them. A common threat can align many differentiated persons towards a common solution, reinforcing the virality and velocity of a trend perceived as relevant.

At the beginning of year 2012 the 30 minute "KONY 2012" documentary, dominated social media feeds and was, by far, the most-viewed video on YouTube at that time. The clip, which was seen over 75 million times, consolidated an unprecedented popularity for a non-profit video, reaching 31 million views in a single day. Over 20 million views were from social media platforms. Some of entertainment's biggest stars, including Rihanna, Justin Bieber, Diddy, and Oprah, shared the video on their social media accounts, and the video quickly became one of the most-shared clips around the world.¹⁰



'KONY 2012', Daily Views from March 4th to March 11th

Source: YouTube Trends Team, source: <http://youtube-trends.blogspot.com/2012/03/tracking-popularity-of-kony-2012.html>

¹⁰ "Tracking the Popularity of 'KONY 2012'", source: <http://youtube-trends.blogspot.com/2012/03/tracking-popularity-of-kony-2012.html>

NOTHING IS MORE POWERFUL THAN AN IDEA
WHOSE TIME HAS COME



Image sequence extracted from 'KONY 2012'
Source: YouTube.com, <https://www.youtube.com/watch?v=Y4MnpzG5Sqc>

“Internet meme” effective attributes: The “Harlem Shake” has exploded

A *meme* is a mimetic action of any digital expression generated and displayed through the Internet; it can be an image, graphic, video, concept, speech, or idea with an identifiable particularity able to be transferred, emulated and recognized. The main principle is to extract a particular element from a digital expression and turn it into a familiar representation. A *meme* requires provoking a cultural comprehension and sympathy to spawn a sharing reaction.

Memes are generally characterized by a set of internet expressions that evolve, sustaining the recognizable mimetic seal. They have a short lifespan, reaching high popularity through months or days, and are not usually considered strong trends. The levels of attraction that *memes* produce are high and are commonly used by some companies to amplify the diffusion of their products.

A *Meme* is commonly defined as a type of *Fad* in term of the duration of the impact within a network, and as a *Fad* is commonly replaced by another *meme* that captures attention. A *meme* has the advantage of transferring information fast between individuals and providing knowledge about a new fashions, behaviors, cultural agreements or activities.

These small movements tend to spread from person to person via social networks, blogs, direct email, or news sources. They may relate to various existing Internet cultures or subcultures. Fads and sensations tend to grow rapidly on the Internet, because the instant communication facilitates word-of-mouth transmission.¹¹

An example of a *meme* is the “Harlem Shake” phenomenon that presents in about 30 seconds two main distinctive parts of a main act coordinated over the same musical piece.

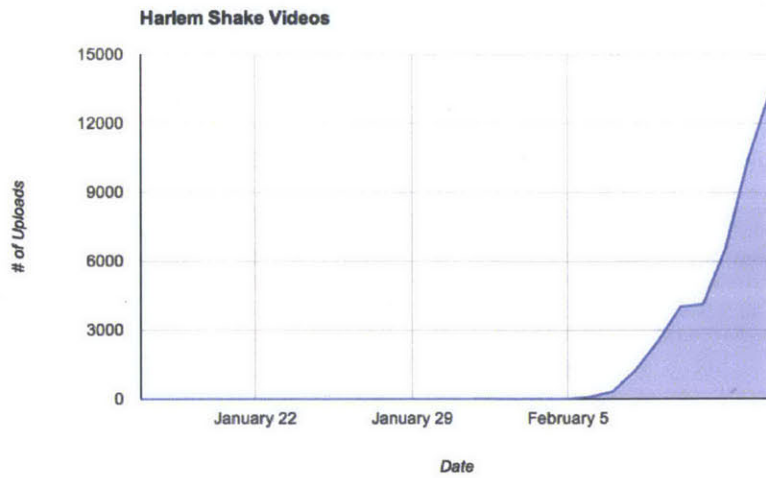
The "Harlem Shake" is best known as dance move from the 1980s. The meme first started gaining traction at the beginning of 2013 and is attributed to a silly video from a blogger named "**Filthy Frank.**" Though it was another user named "**Sunny Coast Skate**" who then established the familiar form. From there, the spin-offs spread very quickly. At the beginning of February 2013, around 12,000 "Harlem Shake" videos had been posted and all their varieties had already been watched upwards of 175 million times.¹²

This success of the videos was in part attributed to the anticipation of the breakout moment and short length, making them very accessible to watch.¹³

¹¹ Schubert, Karen (2003). "Bazaar goes bizarre". USA Today, source Wikipedia: http://en.wikipedia.org/wiki/Internet_meme#cite_note-usatoday-1

¹² Kevin Allocca and YouTube Trends Team, February 2013, "The Harlem Shake Has Exploded", source: <http://youtube-trends.blogspot.com/search?q=harlem+shake&x=31&y=13>

¹³ Mashable. Feb, 2013. "YouTube: Here's How 'Harlem Shake' Went Viral.", retrieved on February 2013, source: <http://mashable.com/>



The graph (left) shows the number of videos uploaded related with “Harlem Shake”; updated on February 2014,

Source: <http://youtube-trends.blogspot.com/search?q=harlem+shake&x=31&y=13>



Three sequence examples of “Harlem Shake” videos

Source: <http://youtube-trends.blogspot.com/search?q=harlem+shake&x=31&y=13>

The following 2013's "Google Trends" rankings show the preponderance of the news that generated impact on Google users.

Source: Google Trends 2013, <http://www.google.com/trends/topcharts#geo=US&date=2013>

Top Trending

1. Paul Walker
2. Boston Marathon Bombing
3. Nelson Mandela
4. Cory Monteith
5. iPhone 5s

More » Embed

Events

1. Boston Marathon
2. Government Shutdown
3. VMAs
4. Moore, Oklahoma Tornado
5. Royal Baby

More »

People, Trending

1. Paul Walker
2. Cory Monteith
3. Aaron Hernandez
4. Adrian Peterson
5. Miley Cyrus

More »

People, Most Searched

1. Miley Cyrus
2. Drake
3. Kim Kardashian
4. Justin Bieber
5. Beyonce

More » Embed Share

Annual Events

1. Black Friday
2. Cyber Monday
3. Daytona 500
4. Chinese New Year
5. Tour de France

More »

7.4 Interaction

Interaction corresponds to the overall perceived utility, concern, cultural contribution or standard, value or statement proposed by a trend within an existent social, economic and technology context. The factors that define *Interaction* are (Figure 9):

7.4.1 Articulation is the practical and direct utilitarian contribution. It presents a new use, style, technique or improvement or facilitates an activity, communication, access to a resource, or enhances a lifestyle, etc. It corresponds to the tangible feature that an element or activity provides, such as a new: fast-food offer, app, device, technology, system, etc.

7.4.2 Resonance: An element with *articulation* can evolve and gain resonance within a network, providing a cultural change or becoming a new standard. Resonance is a sustained and integrated trend, recognized widely, entering different cultures or homophily groups, generating a cultural or value adjustment. Therefore, it incites a network effect. It is a trend that has ubiquity due its recognition and acceptance across differentiated networks. Some examples include the world interest in organic or healthy food, the general concern about human rights, world security issues and economic crises.

7.4.3 Awareness is the not fully recognized capability with forthcoming impact; a potential trend that has an eventual relevant future. In spite of being followed by innovators and early adopters the trend is not fully understood by the majority. Because of its significance, the trend will achieve a central position or even impose and become a standard in the future. Examples include solar energy, electric cars, domestic robots and remote surgery.

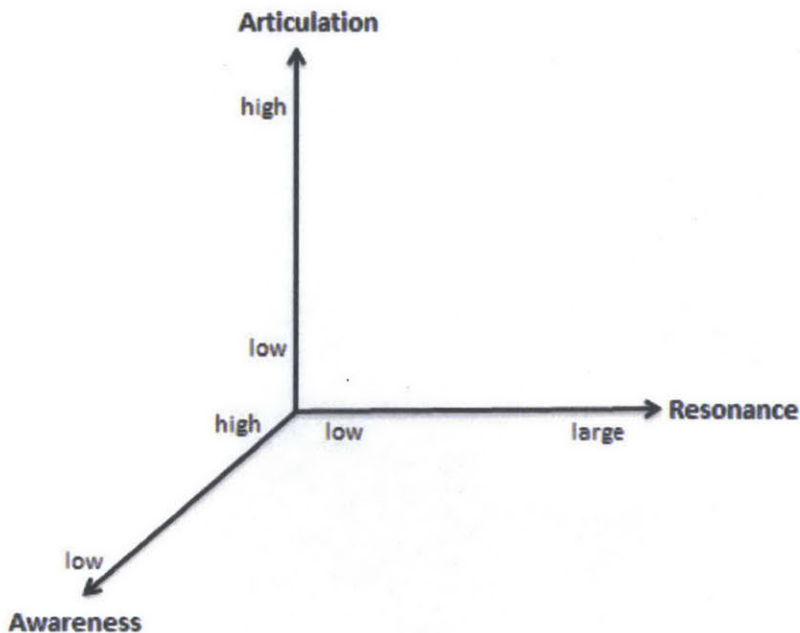
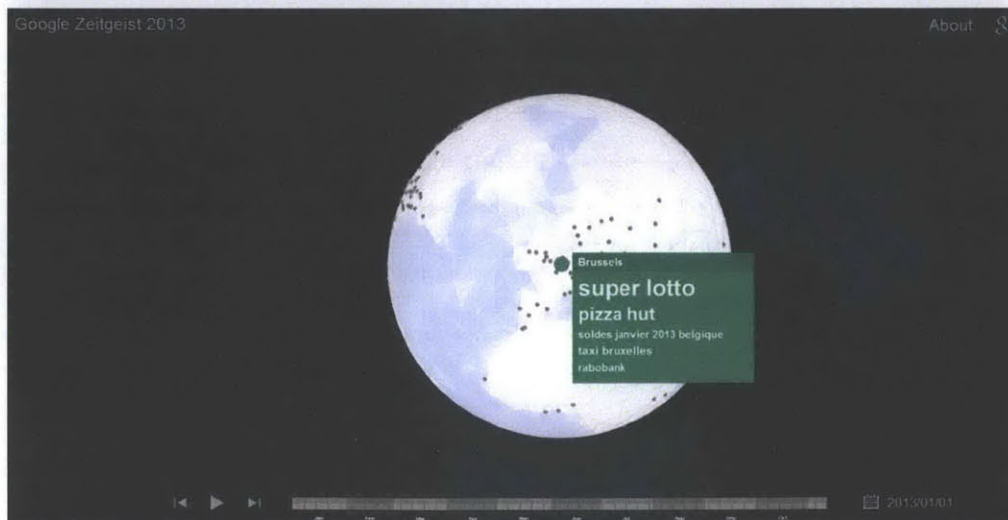
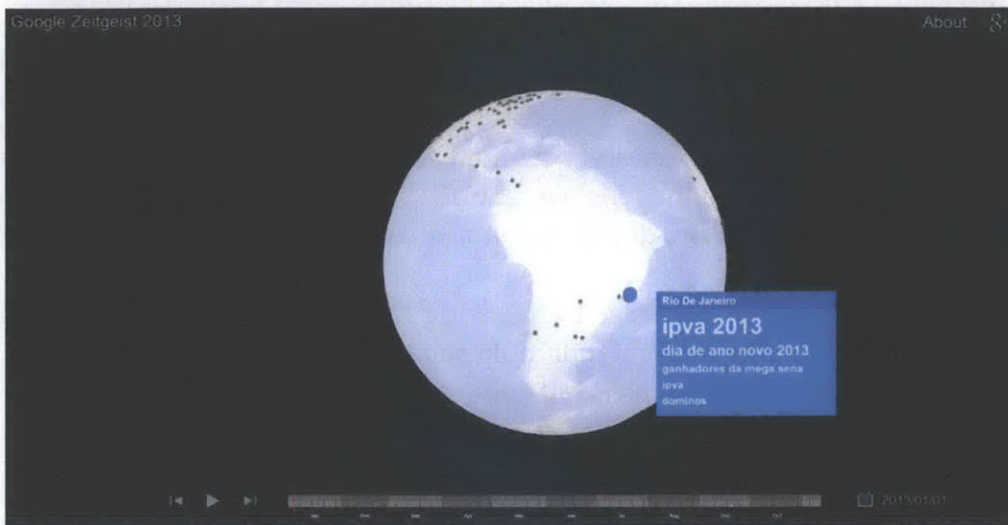


Figure 9. The relation between the factors of "Interaction" expressed in a three axis graph

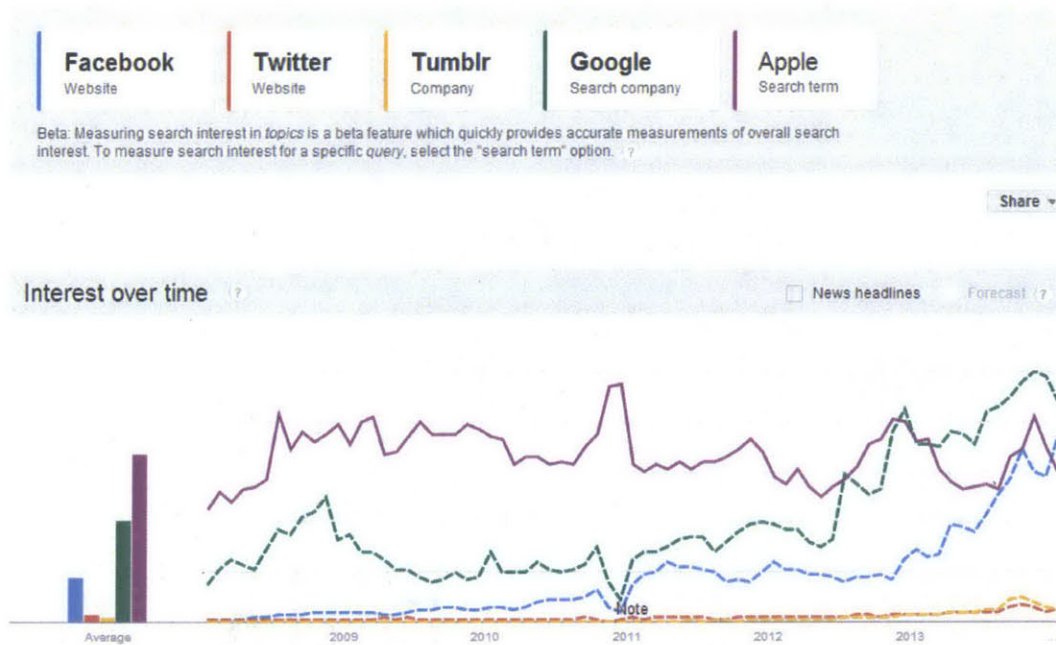
Below, an example of a Trend with high *Articulation*, showed in the worldwide growth of “Fast-Food” orders through Internet during 2013.

Source: Google Trends, <http://www.google.com/trends/>



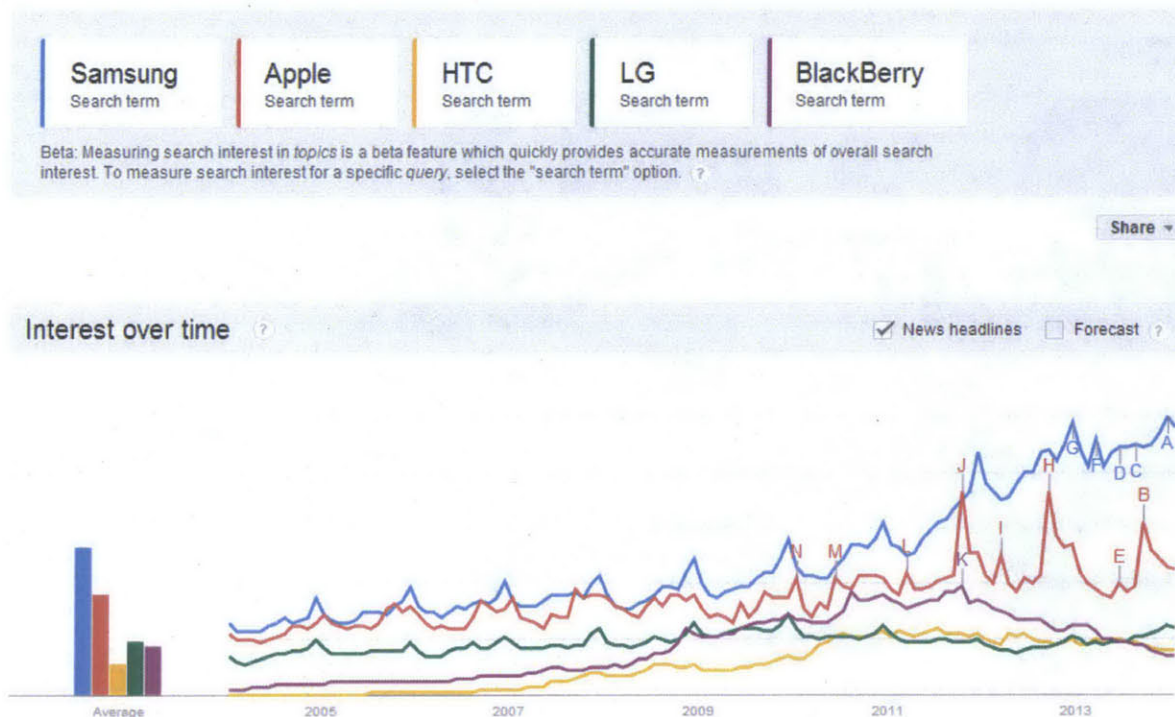
Interest over time of: "Facebook, Twitter, Tumblr, Google and Apple" from 2009 to 2013

Source: Trends Graphs, from Google Trends, <http://www.google.com/trends/>



Interest over time of: "Samsung, Apple, HTC, LG and BlackBerry" from 2005 to 2013

Source: Trends Graphs, from Google Trends, <http://www.google.com/trends/>



Interest over time of: "iPhone 5s, iPhone 5c, Samsung Galaxy S4, and HTC one" from 2005 to 2013, Source: Trends Graphs, from Google Trends, <http://www.google.com/trends/>

Iphone 5s Search term
Iphone 5c Search term
Galaxy S4 Search term
HTC One Search term
Nexus 5 Search term

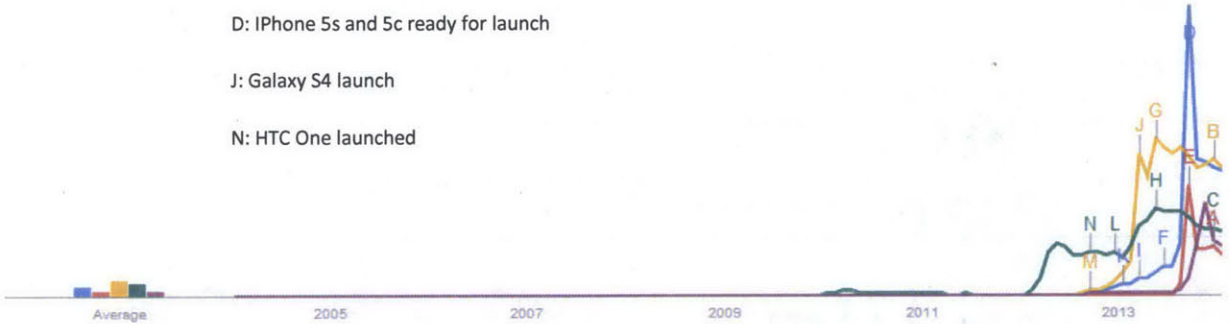
Beta: Measuring search interest in topics is a beta feature which quickly provides accurate measurements of overall search interest. To measure search interest for a specific query, select the "search term" option. ?

Share ▾

Interest over time ?

News headlines Forecast ?

- D: iPhone 5s and 5c ready for launch
- J: Galaxy S4 launch
- N: HTC One launched



8. Network Alteration Effects: Spurring Trends

Trends have complex components and properties with the potential to generate impact and alter several layers of society's behavior, conduct, ideas, goals, values and preferences. The way a trend is presented in media and related to other content is determinant to transform its spread, impact and influence within networks. Following are presented factors, effects and conceptions that could alter the scope and weight of a trend.

8.1 Formulation

Formulation is the development of the trend *singularity*, the definition, elaboration, design and recognition of its unique components that define the trend and outline its scope. A trend's *singularity* will achieve a unique position within a *Genre scope* and contains and expresses the specific features that build the unique individuality that let the trend be identified as unique, capturing enough attention to generate a milestone or trending effect. In spite of the trend may be originated by a unique or a few sources, it can produce an impact recognized across different cultural systems.

The properties that should be taken under consideration are: *genre scope*, *context*, *impact and interaction*.



Frank Gehry's Cleveland Clinic, Lou Ruvo Center for Brain Health; an example of an architectural proposal with singularity, which has a unique design that is widely recognized and valued.

Image Source: Wade Zimmerman©

8.2 Network effect

The *network effect*, generated by the *followers* of a trend, produce an external influence over individuals who are not yet aware of or convinced about a certain behavior or product preference. The effect increases if the number of adopters of the element grows.

The influence is higher if the element that is being adopted by the *followers* provides a visible, relevant and valuable improvement of a certain activity, conduct or behavior inside a network; for example, if a new device improves the communication among network peers, the acceptance, recommendation and pressure process will be higher; a technology that establishes new relational possibilities that are becoming a standard will provoke non-adopters to consider using it.

This effect spurs a voluntary acceptance of the trend.



Image source: Rideship.com ©, <http://www.rideship.com/blog/we-may-be-ushering-in-the-dumbest-generation/>

8.3 The Bandwagon effect

"The probability of any individual to adopt a new trend it increasing with the proportion who have already done so."¹⁴

The Bandwagon effect increases the probability that a not-yet adopted idea, concept, belief, ideology, habit, conduct or trend to be accepted and assimilated if the majority of the individuals within the same network have already done it. It could be considered a type of *Network effect*; the main difference is that the Bandwagon Effect is generated by the force of an external social pressure that triggers a behavior change towards to the perceived majority.

For example, Ideologies, religious or moral concepts are successfully disseminated if the spreading mechanisms are articulated through different cultural strata sources. Ideology groups tend to utilize educational institutions and media to spread and amplify a *message* in order to

¹⁴ Colman, Andrew (2003). "Oxford Dictionary of Psychology." New York: Oxford University Press, p. 77.

produce a *Bandwagon effect*, increasing the distribution, sharing and acceptance of the information presented. Individuals are exposed to different sources and contact points from which they receive the ideological information and which is presented as a unique possible choice.

A technique used by politicians is the *moral concern effect* that attempts to establish behaviors and moral standards in society by inciting a fabricated perceived sense of a *collective conscious agreement* towards some ideological issue, even if the agreement is not consistent with the society's priorities or active reality. The conviction could be imposed by forced cultural redefinitions, established through general voting, social monitoring or even sanctions. A main consideration is that individuals try to conform if the social pressure reaches some extent and, at the same time, adopters play a direct or unconscious monitoring role transferring behaviors, conduct and values.



Image source: Guido Jansen ©, <http://www.gxjansen.com/bandwagon-effect/>

A main strategy of religious groups and other ideology systems is to generate an **Information cascade** that, instead of imposing or forcing an idea, gradually convinces individuals through an information induction to provoke similar responses about the desired belief, behavior and conduct. Individuals will gradually observe, then respect, later assimilate and finally follow what they are being exposed to.

There are four key conditions in an information cascade model:

1. Agents make decisions sequentially
2. Agents make decisions rationally based on the information they have
3. Agents do not have access to the private information of others
4. A limited action space exists (e.g., an adopt/reject decision)¹⁵

¹⁵ Bikhchandani, S., Hirshleifer, D., and Welch, I. (1992). "A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades," *Journal of Political Economy*, Volume 100, Issue 5, source: <http://www.info-cascades.info/>, from Wikipedia.



Image Source: Mike Keefe ©

8.4 Cultural Assimilation

A cultural influence process introduces new, evolved or modified external elements that reformulate old and present standards, modifying existent aspirational desires and goals. Individuals voluntarily acquire an external element to reinforce their belonging to and ownership of the network or to gain differentiation and relevance.

The progression of influence or voluntary assimilation takes an evolutionary direction. The **innovators** tend to acquire the novelty external elements that satisfy the sought desire or differentiation. Then, the followers observe and become aware of the new trend, rejecting it or accepting and maintaining it, merging the new trend with pre-existent ones or even eliminating pre-established proposals.

For example, figure 10 shows through three steps 1, 2 and 3 the evolution of three trends A, B and C within a same Network. Finally C will dominate over A and B because of its properties and a more valued and desired proposition, well-matched with the previous dominant and appreciated trend.

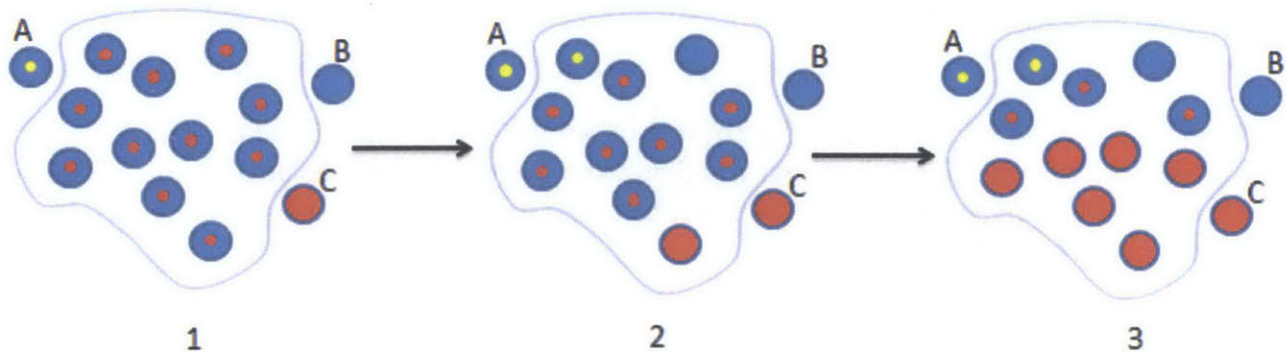
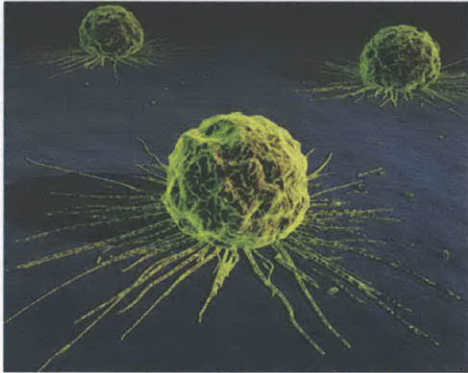


Figure 10. The evolution of three trends in a Network

8.5 Cultural Domination

If a system does not react against a new external cultural influence, the original identity of the network could be debilitated or even disappear, granting its space to the novel set of standards or ideas. If the cultural identity is strong the highest are going to be the possibilities to preserve aspects of the original culture, and therefore to be resistant against external influences.



A microscopic cancer cell,
Image source: David Graeber, "The Cancer in Occupy?"

8.6 Threat Effect

A new trend has a higher chance to be accepted and viralised if both the cultural identity strength elements and the homophily factors within the network are low. In order to increase the chances to successfully insert a certain external trend, concept, idea, behavior, conduct, belief or device in a system, the cultural and homophily factors that could generate rejection can be weakened through the implementation of a common threat, which will cause a perception equivalent to an attenuation of the preexisting differences between the individuals of the network.

If the cultural and individual barriers against "the new thing" are decreased by a *threat effect* the impact of a new collectively recognized and valued element will be higher, because individuals tend to connect and communicate better with others with whom they share preferences and threats. Therefore, ties among individuals could become stronger and, if the threat increases its scope, a potential cross-network communication could be generated. Once the threat diminishes, the differentiator elements between individuals will recover their strength.

The use of the Threat effect to diffuse a product: "Keybiotics" and "The American Parasite"

Candida is "the American Parasite," according to Whole Body Research; and its products can protect you from this horrible danger you didn't know about. These web ads link to a long video explaining the dangers of candida, the American diet, sugary foods, artificial sweeteners, large sodas, and so on.¹⁶

¹⁶ "Truth in Advertising", source: <https://www.truthinadvertising.org/250m-americans-infected-american-parasite/>



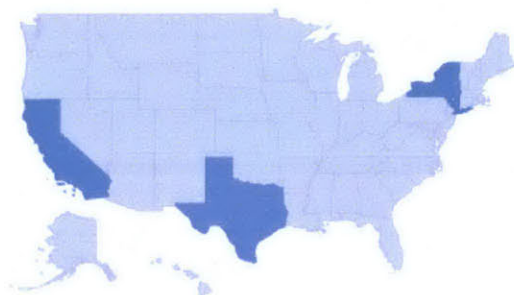
Interest over time of: “The American Parasite” from December 2013 to January 2014

Source: Trends Graphs, from Google Trends, <http://www.google.com/trends/>



Regional interest

Worldwide > United States



Subregion	Metro	City
New York	100	██████████
California	99	██████████
Texas	87	██████████

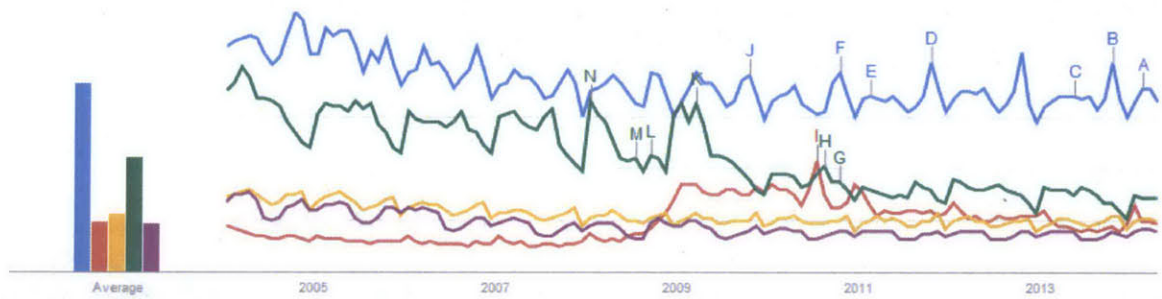
Below are shown how concepts related to threats, including: "cancer, unemployment, diabetes, mortgage and depression", evolved between the years 2005 and 2013

Source: Trends Graphs, from Google Trends, <http://www.google.com/trends/>

cancer Search term
unemplo... Search term
diabetes Search term
mortgage Search term
depression Search term

Interest over time ?

News headlines Forecast ?



Regional interest ?

cancer unemployment diabetes mortgage depression



Related searches ?

cancer unemployment diabetes mortgage depression

Topics	Interest		Queries	Interest	
	Top	Rising		Top	Rising
New York - US State	10		unemployment benefits	100	
Employee benefit - Literature Su...	10		unemployment rate	95	
State - Quotation Subject	5		unemployment office	65	
			pa unemployment	50	
			unemployment claim	50	
			unemployment extension	50	
			nys unemployment	50	

8.7 Aim effect

An *Aim effect* provokes a temporary boosted alignment between differentiated individuals who are driven by the presence, potential realization and awareness of a collective goal and who identify a mutual benefit in cooperating concerning a common purpose and therefore, who agree consciously or unconsciously to leave behind differences for the sake of a defined and identified objective.

8.8 Identity Leveling

A network under a threat effect is more susceptible to seeking, accepting, internalizing and keeping a new external cultural influence and therefore, under that condition, a trend has the highest chances to enter and influence the network insofar as the differentiation factors are kept low.

Even though a product or service diffused through a trend may not generate a durable mood change due to the **Hedonic Treadmill theory**, a theory elaborated by Michael Eysenck¹⁷ that develops the concept that individuals tend to return to a stable or pre-established level of *happiness* regardless of the influence of different experiences. The theory states that changes of people's moods due to or material acquisitions or temporary experiences are not sustained and the effect of the gratification obtained expires quickly. Individuals re-experience cravings and so they reinitiate the cycle of search, selection and purchase. The concept of the treadmill refers to the idea that even in the presence of external stimuli that could provoke mood changes, individuals tend to remain in the same status.

The temporary effects delivered from temporary trends or *Fads* is highly affected by the level of saturation and substitution within the *Genre scope* or industry where the trend is located. For example, in fashion business products expire fast, losing their validation if the design and the cultural meaning delivered by the brand are not enough to transcend the fast cycle of changes proposed by the staging of new trends, which pretend to substitute the current proposals and establish new fashion standards progressively. Something similar happens with technological products that are constantly replaced by new versions that quickly become outdated, causing users to craving the new devices.

Each new launched element will generate or increase a craving effect within a *Genre Scope* that then will increment the compulsion to acquire and dismiss belongings. The premeditated creation of a craving effect in a social network generates a perceived new standard that induces individuals to consider that new level as an implicit benchmark that must be achieved, provoking a sense of longing and therefore triggering a cycle of search, selection and acquisition.

¹⁷ M. H. Apley, ed. (1971). "Adaptation Level Theory: A Symposium", New York: Academic Press, 1971, pp. 287–302.

9. Profiling and Segmenting

9.1 Networks formation

The identification of the shared elements that individuals have in common within a network is the key to understanding the cultural, behavioral and social aspects that are causing the connection. Moreover, actors could virtually belong to several differentiated networks depending on the specific analogous preferences and potential connection drives.

Groups have several factors in common, which establish the required link types between individuals that meet the requirements to be considered as part of the network. Furthermore, individuals belong to a network and are accepted for multiple reasons: culture, religion, heritage, interests, gender, age, geography, politics, lifestyle, etc. An individual chooses to connect or relate with others because they express, possess, have, follow or believe somewhat in common.

For example, individuals are part of a religious group because the group has enough heritage, ideological and cultural elements with which they identify; likewise, members of a political party could share common ideals or just join for strategic reasons. Each member who is a part of a specific group accepts and shares a minimum number of elements required to be recognized and accepted by other network actors. In a macro-scale, countries are formed by macro-networks which are dynamically composed by homophily subgroups organically defined by family heritage, geographical location, cult, language and other cultural, historic and physical attributes.

9.2 Inter-Network links

The strength of a link depends of several factors. For example, in tribal organizations the tightness is sustained by the possession of a strong cultural and ethnic identity that identifies and separates one member of a group from the members of another tribe. It is a precondition for members of a tribe to be recognized by the others who have a strong feeling regarding the mutual group¹⁸. Two related but separated tribes can share several or almost the same links facets having several identity distinctions, even though they will be disconnected or not fully merged because of specific factors that establish differences. For example, it is enough that the same tribe distributed into two not directly connected zones; after a few generations, they have enough differences, recognized by them both, to be considered as two tribes.

Despite the degrees of dissimilarities inherited, if a certain tribe should decide with which tribal group it should come together, in order to confront some difficulty or to defend themselves against an enemy, it will choose the one with the highest similarities, relativizing the differences in relation to the intensity of the *threat effect*.

¹⁸ *Kanakasena Dekā; Kanakasena Dekā (1993). "Assam's Crisis: Myth & Reality", Mittal Publications, p. 90.*

On the other hand, a political party, a group defined by ideals, values, and shared political purposes, in order to exist, requires allocating its members in as many as possible seats in parliamentary and governmental institutions. Parties participate in electoral campaigns, educational outreach or demonstration actions, espousing an ideology or vision expressed in the party program, bolstered by a written platform with specific goals and forming a coalition among disparate interests.¹⁹ Just as with the tribes, a political party will unite with other formal political groups to face common interest issues, to increase domination, to gain political power, to lobbying, or to join forces against a political menace, etc.

Correspondingly, religious groups, defined as individuals with collective ideological and spiritual traditions, will also match with other religious groups in situations where common moral values are jeopardized by some ideological position, such as a certain law proposed by the congress. One example is the Manhattan Declaration of 2009, issued by a group of Christian leaders from various Christian denominations that looked for an "influential statement that united Evangelicals and Catholic leaders in fighting abortion and gay marriage"; as of November 2010, the Declaration had been signed by over 475,000 individuals.²⁰

9.3 Strengthening links of Networks

A network is a set of individuals in some relation to one another²¹ who have ties that associate a definite set of actors. Each one can present and define different degrees of strength that, under an external stimulus, a common threat or other stated effect, may reinforce the connection, change it, attenuate it, or even lose it.

A *peer group* is both a social and a primary group of people, who, through **Homophily**, share similarities such as age, background, and social status. The members of this group are likely to influence others' beliefs and behavior²² and therefore, establish the first degree of guidance and the source from which the basic identity aspects build the individual self. If the homophily attributes are increased between peers, the links become stronger and the social network's cohesion within its members gains definition. If individuals share enough common characteristics, they will keep connected and each individual will be able to identify others and recognize common behavioral information.

A peer network has an underlying trust convention depending on the characteristics of its members. Adolescents prefer to talk about school with their parents, but about sex and other interpersonal relationships with their peers. Children look to join peer groups who accept them, even if the group is involved in negative activities, and are less likely to accept those who are different from them.²³

¹⁹ Definition of "Political Party", source: Wikipedia, http://en.wikipedia.org/wiki/Political_party, updated on January 2014.

²⁰ "The Manhattan Declaration, A Call of Christian Conscience", November 2009, source: http://manhattandecclaration.org/man_dec_resources/Manhattan_Declaration_full_text.pdf

²¹ Definition of "Social Group", January 2014, sources: Wikipedia, <http://en.wikipedia.org/wiki/Group>, http://en.wikipedia.org/wiki/Social_group

²² Definition of "Peer group", Dictionary.com. Retrieved October 25, 2012, source: <http://dictionary.reference.com/browse/peer+group>

²³ Steinberg, Laurence (2010). "Adolescence.", New York: McGraw Hill.

Personality and identity are main elements that peer groups collaborate to develop in their members. Studies have showed that peers provide normative regulation and a staging ground for the practice of social behaviors.²⁴ If the common shared elements increase within a group, the level of influence of the group over the individual tends to be higher. Individuals who accept the nature of the network to which they belong change their behavior yielding in favor of the common conduct.²⁵

Individuals can compare their own groups with those of others, recognizing and increasing their sense of belonging. The primary discernments between own groups and others are that own groups:

- Favor the in-group (own) over the out-group (other)
- Exaggerate and overgeneralize the differences between the in-group and the out-group (to enhance group distinctiveness)
- Minimize the perception of differences between in-group members
- Remember more detailed and positive information about the in-group,
- Perceive a more negative information about the out group²⁶

The extent to which individuals are connected can be understood by the following factors:

9.3.1 Homophily: The extent to which actors form ties with similar versus dissimilar others. Similarity can be defined by gender, race, age, occupation, educational achievement, status, values or any other salient characteristic.²⁷

9.3.2 Political Homophily: The extent to which individuals from a similar political group or conglomerate share enough common political ideas and goals bounded by the perceived appropriate role of society, government, institutions and regulations, such as the role of the economy, social and civic rights, the scope of religion, rules, and taxes; and ethical postures toward such issues as abortion, divorce, gay marriage, euthanasia, drug consumption, and capital punishment.

9.3.3 Propinquity: The tendency for actors to have more ties with geographically close others.²⁸

To answer the interrogation of how defined groups can alter their delimitation and merge, it is required to understand how the connections are formed. For example, two political parties can be differentiated by several factors that outline their individuality: the vision about the role and size of the state in society, the role of the justice system, the amount and flexibility of private regulations, taxes, ideologies, etc.; both can be antagonists in one circumstance and in another might decide to merge.

²⁴ Friedman, Howard (2011). "Personality: Classic theories and modern research." Boston: Allyn & Bacon.

²⁵ Crano, W. D. (2000). "Milestones in the psychological analysis of social influence." Group Dynamics: Theory, Research, and Practice Vol. 4, EPF, 2000.

²⁶ Gaertner, S. L.; Dovidio, J. F.; Banker, B. S.; Houlette, M.; Johnson, K. M.; McGlynn, E. A. (2000). "Reducing intergroup conflict: From superordinate goals to decategorization, recategorization, and mutual differentiation." Group Dynamics: Theory, Research, and Practice, Vol. 4, EPF 2000.

²⁷ McPherson, N., Smith-Lovin, L., Cook, J.M. (2001). "Birds of a feather: Homophily in social networks.", Annual Review of Sociology 27.

²⁸ Kadushin, C. (2012). "Understanding social networks: Theories, concepts, and findings." Oxford: Oxford University Press.

The external factors that influence a potential merger is related to an outside force that has a common purpose or threat, impelling a common implicit or explicit reaction that ends in a decision to merge. That external influence generates an equivalent effect of a weakening of the *Political Homophily* aspects, i.e. the differentiated factors are not enough to keep the distinction between groups and therefore they decide to unite temporarily or permanently towards the same cause, for example, in the presence of a political election or to set a new law in parliament, or even motivated just by a temporary communicational reason.

An example of collaboration in politics can be observed in the presidential election of Chile of 2013 where several different antagonistic political groups of leftist parties formed a coalition in order to turn around and win the presidential elections in opposition to the former government. The Chilean political party New Majority is a coalition formed by the Christian Democracy Party, the Communist Party, the Socialist Party, the Party for Democracy, the Radical Party, the Broad Social movement and some other similar groups. The aim of its formation was to gain political weight in a binominal electoral context and in the presidential elections in order to defeat the opposite coalition. Eventually, their presidential candidate Michelle Bachelet won the elections in December of 2013.

This collaborative strategy loosens *Political Homophily* elements that previously existed. In the same coalition, two antagonistic parties, the Christian Democracy Party and the Communist Party, joined the same group despite their value differences regarding gay marriage, abortion, the role of the state, and constitutional and economic reforms; they preferred to overlook their differences to obtain seats in the parliament and win the presidential election. Moreover, the ideological similarities between the Chilean Christian Democratic Party and the center right Chilean parties were much greater, but since there were no electoral incentives among these parties, the cooperation didn't exist.

Therefore, no matter the differentiated elements, a higher purpose or threat dilutes the differences of groups.

A second example of how higher purposes can override differences can be observed in the international maritime dispute between Chile and Peru over the sovereignty of a sea area in the Pacific Ocean; the conflict generated a complete internal alignment in each country. Peru signed in December 2013 the National Unity Agreement that coordinates all public institutions and political parties for the sea cause²⁹; then, a similar strategy followed in Chile with several agreements and collective efforts of major political parties.

The list of groups that decide to collaborate against a common threat is large and has existed since the origin of the human society, when tribes had to unite against a common enemy or to oppose an external conqueror.

Moreover, when the threat comes from the inside, a real or artificial action to cause an alignment is needed. This is known as **Diversiónary Foreign Policy**, such as a war instigated by a country's leader in order to distract its population from their own domestic strife. The concept

²⁹ Secretaría Ejecutiva del Acuerdo Nacional; Lima, Peru; January, 2014; <http://www.acuerdonacional.pe/node/2169>

stems from the **Diversionsary War Theory**, which states that leaders who are threatened by domestic turmoil occasionally initiate an international conflict in order to shift the nation's attention away from internal troubles. This external threat would counter the domestic strife and ensure the leader's position in power. Essentially, a diversionary use of force is a manipulation of the *Rally 'round the flag effect*, causing an increase of national fervor from the general public.³⁰ As an example, can be seen in the strong increment of popularity, up to 80%, of the President George W. Bush after the September 11, 2001 attack.³¹

9.4 Grouping

A common threat or a common goal will increase the similarity and assimilation of individuals within networks, intensifying their ties or generating new ones. New connections establish novel relations that group actors in different ways. Each new trend may generate new groups able to divide or merge dynamically in relation to the causes and effects that influence them.

Figure 11

Networks can reinforce and multiply their ties until they produce '**cliques**' where every individual is directly tied to every other individual³²; or random actors could naturally form a '**temporary trend circle**' with more diversity between actors' links and triggered by an external factor or trend that increments the **Clustering coefficient**, a measure of the likelihood that two associates of a node are associated; a higher *clustering coefficient* indicates a greater '*cliquishness*'³³ due to common purposes, external influences, similar preferences, cultural or homophily factors, among others, which gradually increment the **Cohesion**, the tendency for a group to be in unity while working towards the same goal or to satisfy the emotional needs of its members.³⁴

³⁰ Sobek, David (2007). "Rallying Around the Podesta: Testing Diversionary Theory Across Time." *Journal of Peace Research* 44.1 (2007): 29-45. 20 Oct. 2008 and http://en.wikipedia.org/wiki/Rally_'round_the_flag_effect

³¹ Definition of "Diversionary foreign policy, Evolution", from Wikipedia, source: http://en.wikipedia.org/wiki/Diversionary_foreign_policy#cite_note-1

³² Definition of "Cliques", from Wikipedia, source: <http://en.wikipedia.org/wiki/Cliques>

³³ Hanneman, Robert A. & Riddle, Mark (2011). "Concepts and Measures for Basic Network Analysis." *The Sage Handbook of Social Network Analysis*. City: Sage

³⁴ Definition of "Social Cohesion", from Wikipedia, source: http://en.wikipedia.org/wiki/Social_cohesion

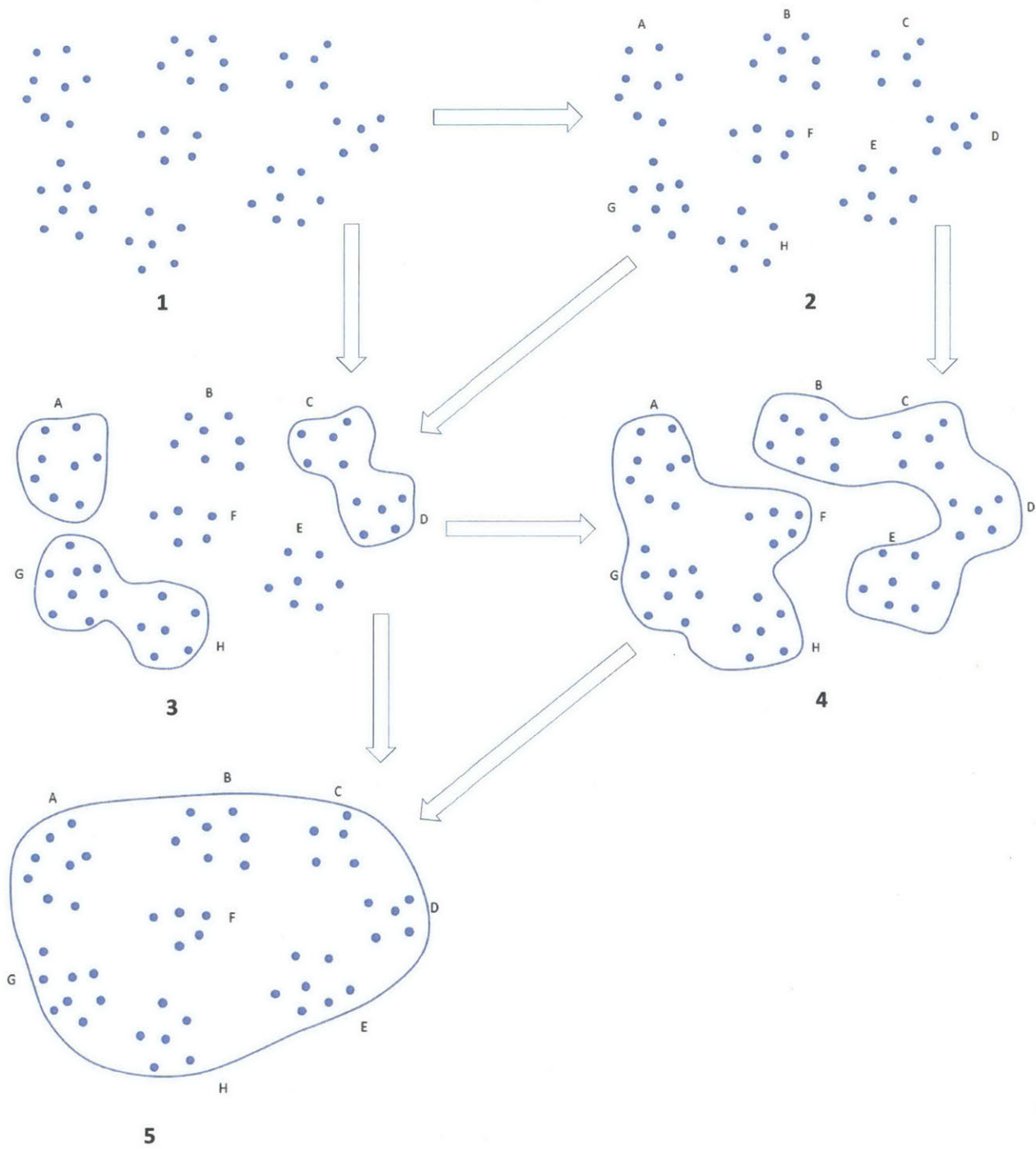


Figure 11. Due to the effects that trends exert on individuals new combinations of groups are formed

9.5 Profiling individuals based on aspiration and differentiation

Any artistic or cultural expression, such as media, films, fashion, design and music, contains cultural and identity elements, concepts and ideologies that establish for individuals a potential or desired reality, a possible reference or standard that could determine a new paradigm to be achieved. New paradigms propose new identity choices, and also, *differentiation* resources for individuals, who look for ways to achieve individuality and sociocultural evolution, but at the same time, ownership of a certain group with which they share common identity or instrumental elements.

Differentiation, a term used in system theory and sociology, explain several behaviors of individuals, useful to understand their comportment within networks. From the viewpoint of this theory, the principal feature of modern society is the increased process of system differentiation as a way of dealing with the complexity of its environment. This is accomplished through the creation of subsystems in an effort to copy within a system the difference between it and the environment. The differentiation process is a means of increasing the complexity of a system, since each subsystem can make different connections with other subsystems. It allows for more variation within the system in order to respond to variation in the environment. Increased variation facilitated by differentiation not only allows for better responses to the environment, but also allows for faster evolution (or perhaps sociocultural evolution), which is defined sociologically as a process of selection from variation; the more differentiation (and thus variation) that is available, the better the selection.³⁵

9.6 Profiling based on preferences

Individuals' product and service choices reflect their needs, moods, personality, ideals, self-perception, aspirations and projections. For example, a preferred set of fashion products contains information about the image that a person is consciously or unconsciously projecting to society.

In fashion, the stance that individuals declare by their appearance, regarding the related networks, can be consonant, dissonant or something in between. The elements that individuals choose tend to be related to their identity, and they implicitly or explicitly project their own image to others through elements that display and transmit evidence of their state, such as moods, conformity, educational level, social status, age, sex orientation, culture, origin; and even longings, past traumas, and desired projected self.

Color choices reflect individuals' moods. The preference for desaturated colors may reflect a protective or defensive status, an introvert personality or even neutral and somber moods. On the other hand, bright colors express and represent positive and happy moods. See Figure 12.

³⁵ Ritzer, George. (2007), "Contemporary Sociological Theory and Its Classical Roots: The Basics.", Second Edition. New York: McGraw Hill.

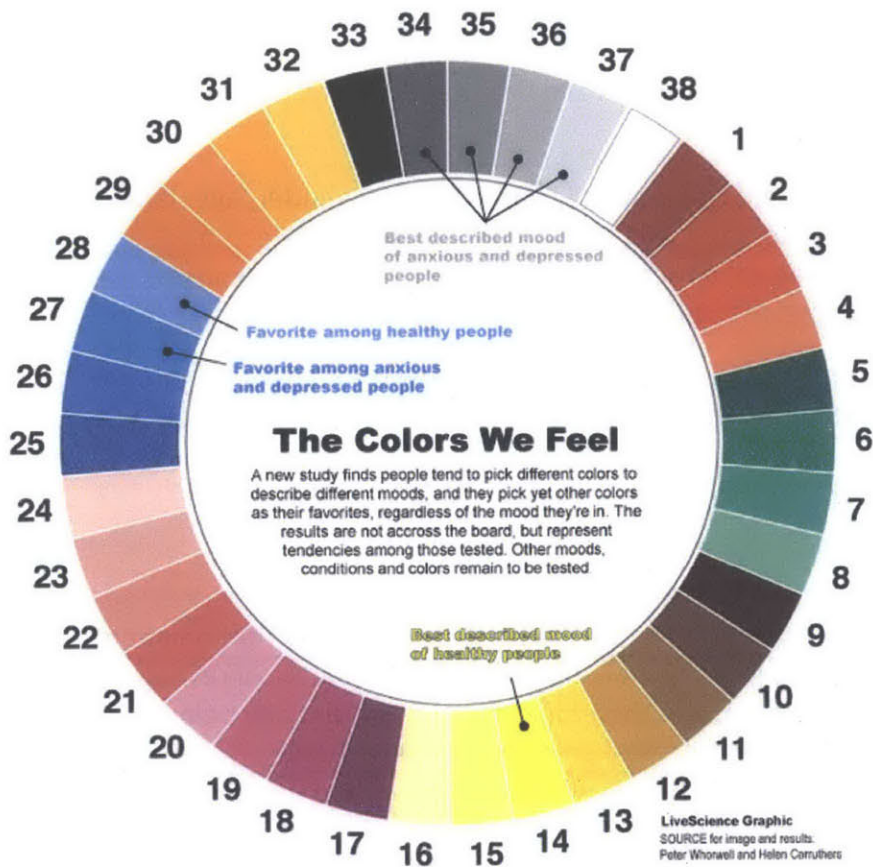


Figure 12. "The Colors We Feel"

People tend to pick different colors to describe different moods, and they pick yet other colors as their favorites, regardless on the mood they're in.

Source: Peter Whorwell and Helen Carruthers

The individuals' representation about the perceived identity of the group is an ongoing process done by individuals in order to be part and be accepted by the group to which they want to be part of.



Image left source: © 2013 Nuclear Blast, <http://www.nuclearblast.de/en/rp/genres/thrash-metal.html>
Image right source: © Nicola Dove/Miramax Films, [Nytimes.com](http://www.nytimes.com)

The preference for mild-classic style fashion products reflects an attitude of acceptance of the culture or social establishment. On the other hand, the choice of “edgy” fashion designs reveals a stronger desire to differentiate within a *Genre Scope*. Companies need to define their targeted *Genre Scope* to set a differentiated proposal, and then generate stronger ties with the followers.

Preferences reflect group belonging, revealing homophily particularities: gender, age, language, localization and social segmentation; also, they uncover potential common aspects and characteristics of individuals: beliefs, values, education, etc., and consequently, expose potential relationships and communications between them.³⁶

Each new placed standard can potentially generate novel user preferences since the new set of paradigms delivers the perception that novel and uncovered necessities have emerged.

10. Setting Strategy

A trend, as the tendency toward which preferences are directed, contains information about cultural backgrounds, homophily factors, identity marks and mood states. A trend reveals that implicit connections between followers exist, and therefore, that they potentially belong to virtual networks elaborated from their preferences of products and services.

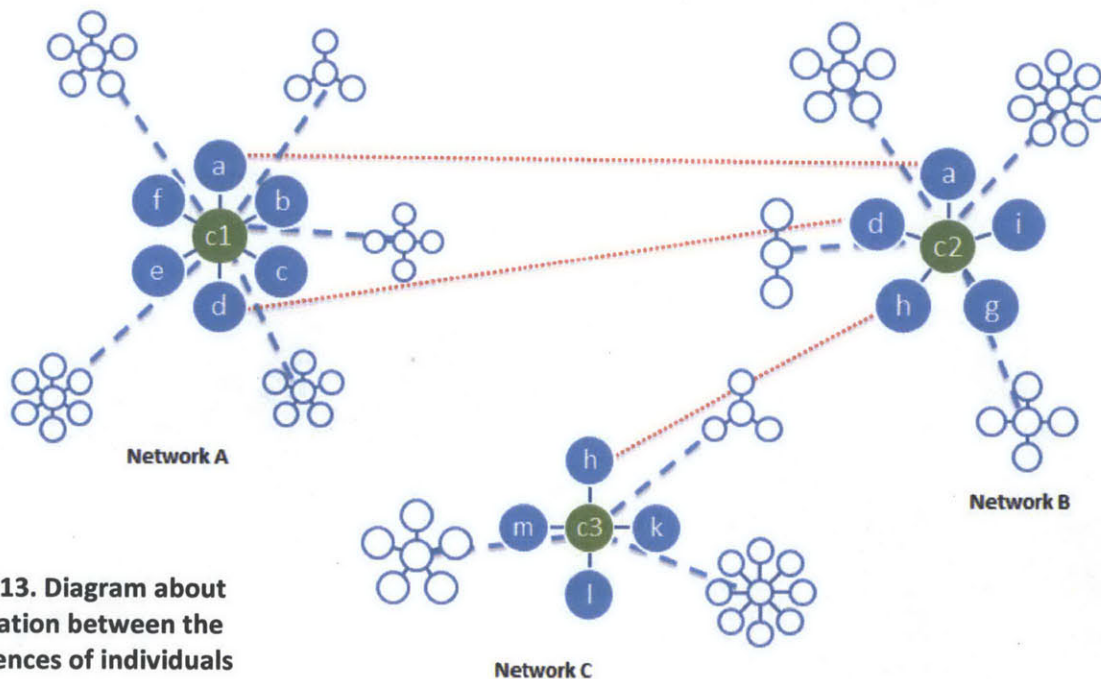


Figure 13. Diagram about the relation between the preferences of individuals

As shown in Figure 13, the three Networks “A”, “B” and “C” contain three individuals **c1**, **c2** and **c3** who have preferences for different products: individual **c1** for **a**, **b**, **c**, **d**, **e** and **f**; individual **c2**

³⁶ McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology* 27.

for **a, i, g, h,** and **d**; and individual **c3** for **h, k, l** and **m**. Even though there are no conscious ties between networks, actors **c1** and **c2** share two preferred products and actors **c2** and **c3** share just one.

Assuming that the preferences of each actor contain the identity, cultural and functional defining elements of the individual, it can be concluded that 40% of actor **c2**'s identity factors match 33% of **c1**'s factors. Similarly, 25% of **c3**'s identity factors match 40% of **c2**'s.

The types of relations between detached individuals who share similar preferences can take several forms within the Internet; an auction platform will make them compete against each other in order to acquire a product or service, and a collaborative platform will make them cooperate to reach a defined and required quantity of the desired product or service.

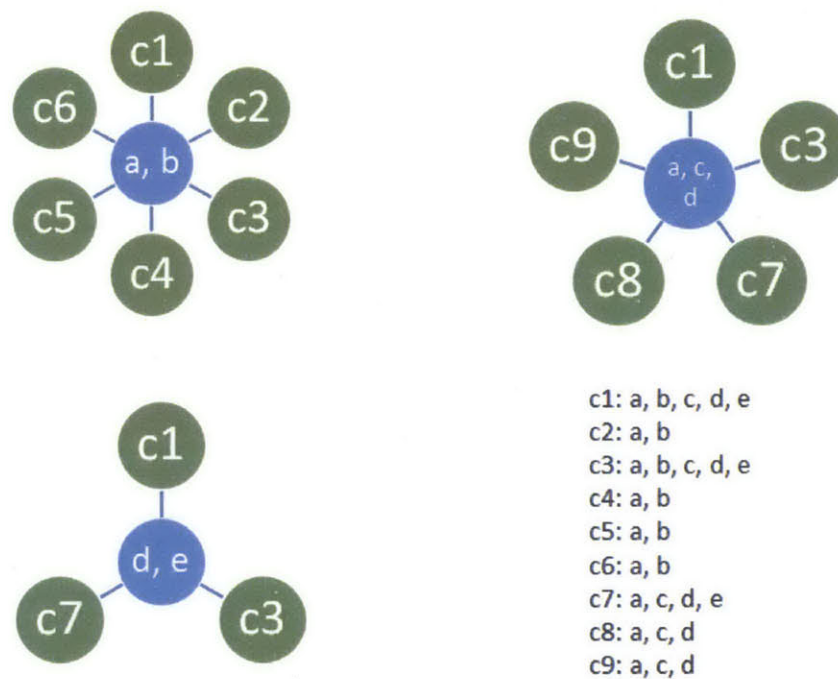


Figure 14: Diagram about the relationship between product networks

As shown in Figure 14, actors **c1** to **c9** share different amounts of products, services or interests identified as: **a, b, c, d** and **e**. The individuals that have more elements in common are **c1** and **c3**, because they prefer all elements, and the ones that have less are **c2, c4, c5** and **c6** since they have interest in or are aware of only two elements.

Because **c1** and **c3** have already selected more products than the rest of the individuals, they are the ones that can potentially transfer the knowledge about the non-selected products to the rest of the users; considering that **c1** and **c3** already share several preferences with the rest of the users, these should choose similar products.

11. Trend Centrality

Trend centrality, the capacity to transform and deliver knowledge inside and beyond an individual's own network, refers to an individual who has both potential access to different networks, due to the existence of shared elements with not-yet connected actors, and the capability to translate the information in order to be understood by other actors from the same or different networks.

In Figure 15, individual "b" from Network "B" doesn't have a tie with individual "i" from Network "A" but has the ability to translate the message that came from network "B" in order to be understood by "i." In the same manner, individual "v" from Network "B" doesn't have a link with "q" from Network "C" but is the only one that carries information from Network "B" that can traduce it in order to be understood by "q." Therefore both "b" and "v" possess the highest "Trend Centrality," with "b" having the higher degree.

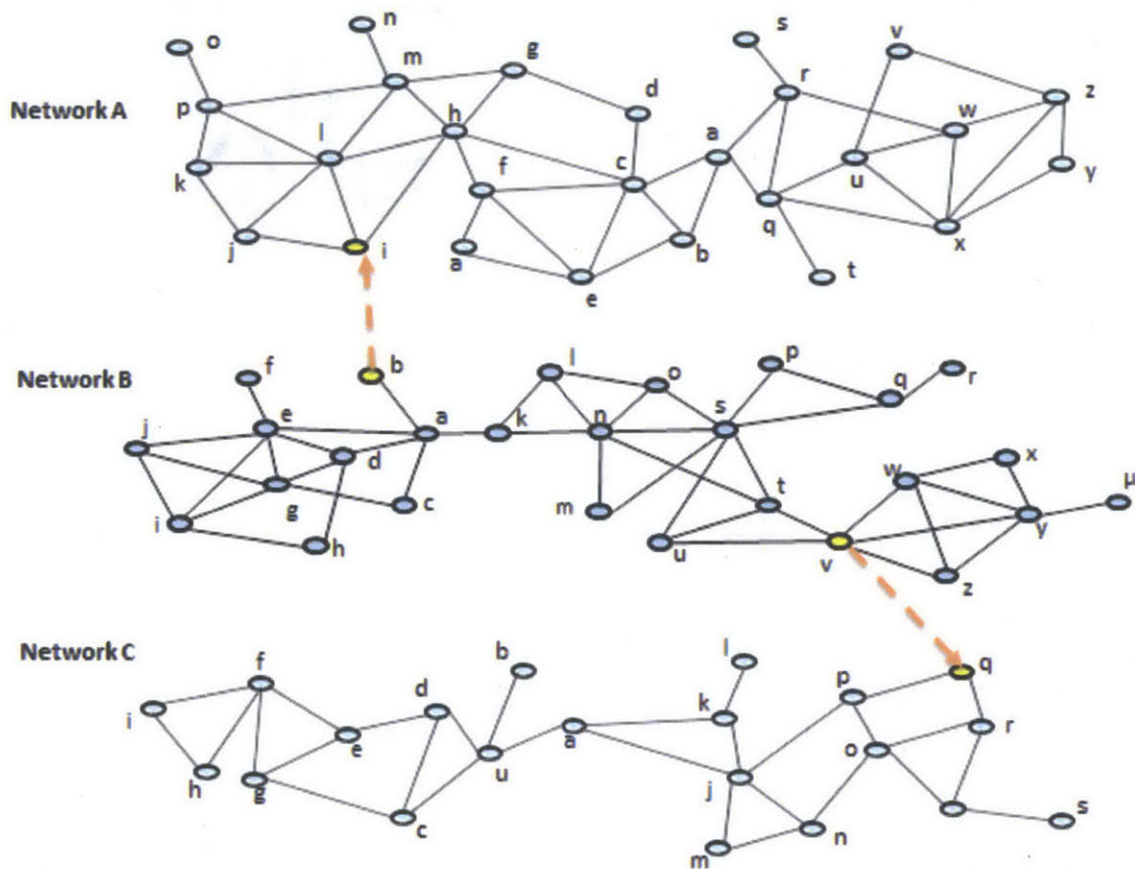


Figure 15. The diffusion of a trend from one network to other networks by actors with "Trend Centrality"

Once the communication, between the users that carries the information and the ones from other networks, is established, a subsequent communication within each network can be generated. In this case, the diffusion sequence from Network "B" to Network "A" and "C" that

was not previously possible without the presence of individuals “b” and “v” now enables the origination of the **Adoption Lifecycle** across the three networks because now other actors can access and understand the message. See Figure 16 and 17.

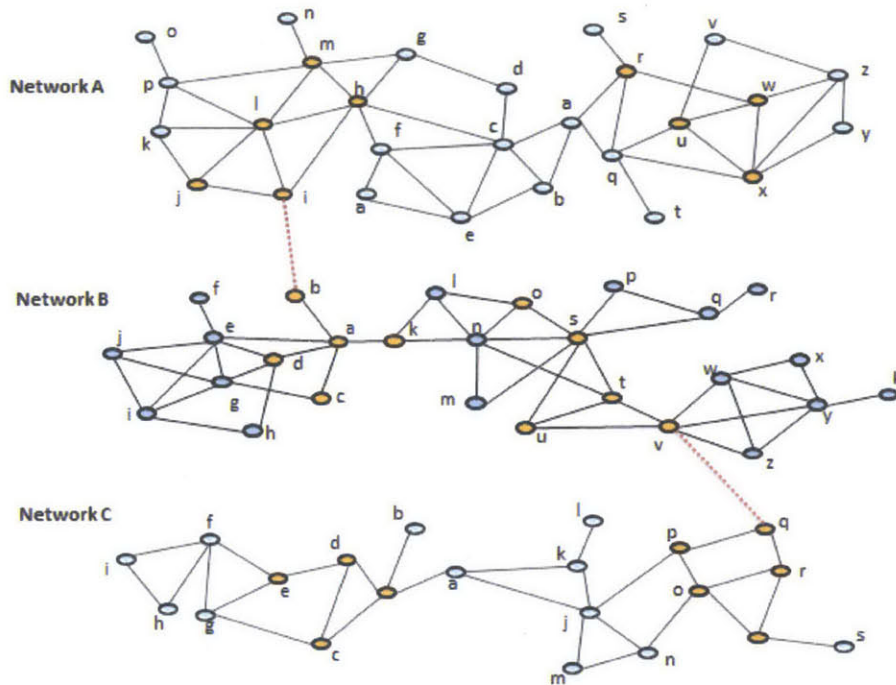


Figure 16. The diffusion of a trend through “early adopters”

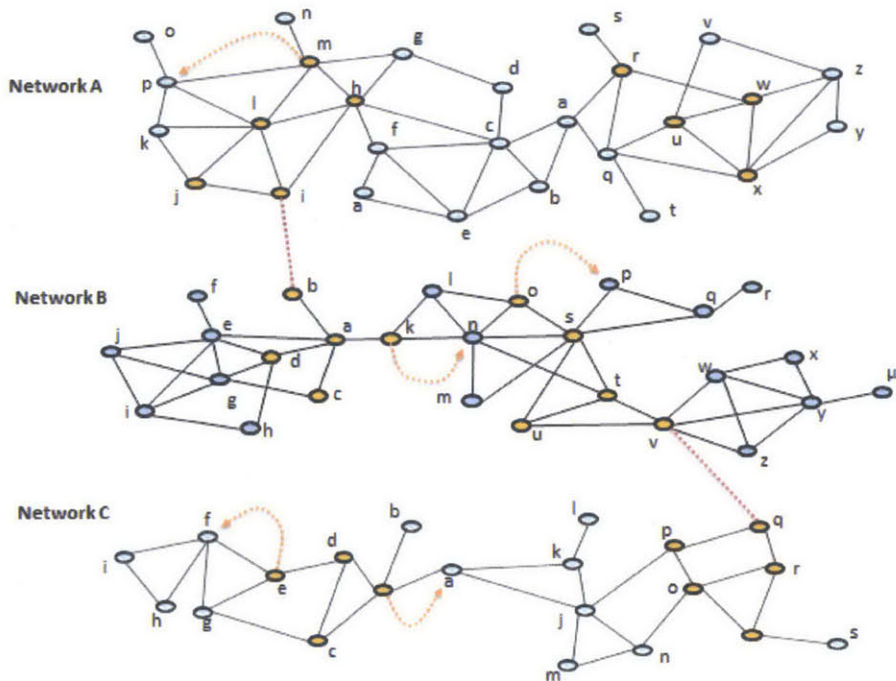


Figure 17. The diffusion of a trend from “early adopters” to “early majority”

12. Sequence Segmentation

Information technologies increase the generation of trends exponentially, allowing the knowledge to be accessed and delivered almost instantly without any barrier and at almost zero cost.

Web sites in which individuals learn, communicate, interact and realize transactions, such as Internet platforms, social networks or e-commerce sites, dynamically influence actors' preferences and from there, amplify the access to new ideas, products and categories that reshape interests and generate new potential interactions. Even though individuals do not know or do not have formal ties with other actors who choose the same products, categories or interests, they do share common preferences, and therefore, they do have intrinsic associations established from the common selected elements. That implicit connection is contextual and defines indirectly new groups that could move to different networks to get more knowledge.

The Internet allows individuals to potentially belong to several differentiated networks. Each one contains a fragment of the identity information of the individual.

The dynamic changes of preferences and networks entered require reformulating the way individuals are commonly clustered. The traditional static segmentation criteria group individuals from the following angles: (Figure 18)

Geographic Segmentation groups actors according to geographic boundaries and a space extent: by country, region, continent, local area, city, population or subgroup that is geographically located, or zone delimited by climate or geographical conditions, etc.³⁷

Demographic or Homophily Segmentation groups individuals based on personal attributes, such as: ethnicity, nationality, education level, income, religion, gender, social status or position, age, occupation, family size.³⁸

Behavioral Segmentation groups actors based on their behavior regarding institutions, brands, products and services, such as: loyalty, recurrence, readiness to buy, personal rates, user status, situations, benefits sought.³⁹

Psychographic Segmentation groups individuals based on elements of their lifestyle, such as: interests, values, personality, opinions, attitudes, social class, etc.⁴⁰

³⁷ Kotler, Philip, and Kevin Lane Keller (2006). "What is geographic segmentation" Marketing Management. New Jersey, Prentice Hall, 2006.

³⁸ Goldstein, Doug (2007). "What is Customer Segmentation?" Mind of Marketing, New York, May 2007.

³⁹ Ibid.

⁴⁰ Ibid.

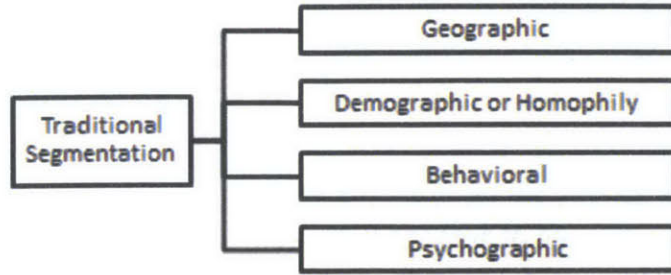


Figure 18. A traditional segmentation diagram

Information technologies allow the use of *sequence-segmentation* analysis that captures the traces of the dynamic evolution of individuals that change their interest and interactions from the sequence of knowledge pieces received. A trend, as the tendency towards which an element moves to, generates a progressive change of actors' awareness, which ends in a conscious state that generates enticement and hence alters their conduct and predilections and provokes potential shifts to other networks, categories, paradigms, standards, etc.

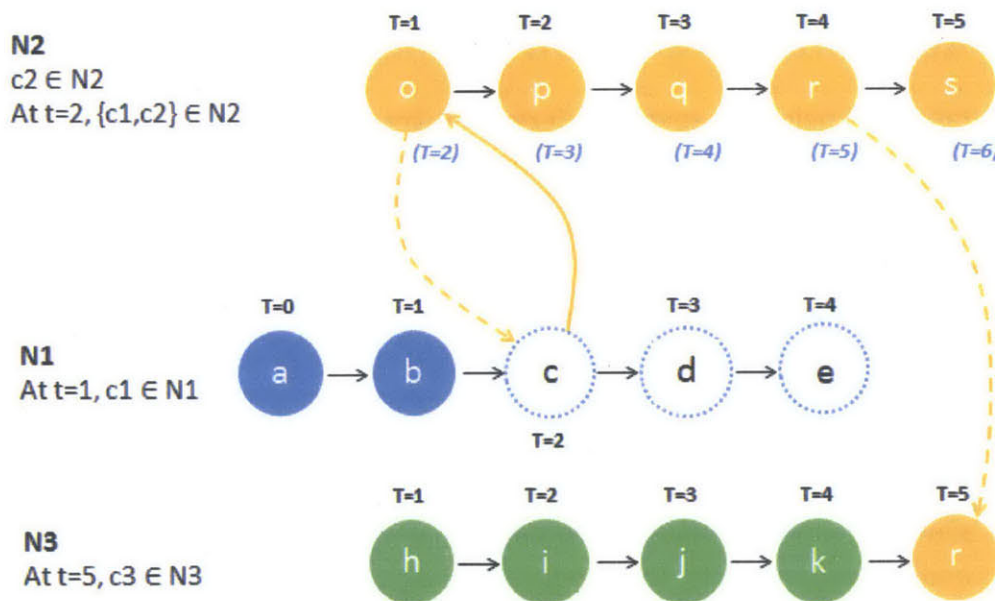


Figure 19. A sequence-segmentation diagram

As is shown in Figure 19, individual c_1 who belongs to Network N_1 sequentially selects elements. At time $t=0$, c_1 selects, e.g. a technological communication device “a” that belongs to a brand “x”, then, at time $t=1$, the technological standard of “a” provokes the election of complementary products or services, e.g. accessories or a mobile application, identified as “b”. However, at time $t=2$, individual c_1 decides to abandon its current communication technology (b) influenced by individual c_2 who belongs to Network N_2 and who uses a different technology (o) that was perceived as better by c_1 . Since individual c_1 decides to abandon its device, the potential subsequent products: c, d and e related to the old device will not be acquired;

instead, **c1** will shift to a different group, a new implicit network that uses the new desired technology contained in the device “**o**” and acquired by individual **c2** at time $t=1$, but observed and acquired by individual **c1** at time $t=2$. Therefore, **c1** will move to Network **N2** and will initiate a different sequence of acquisitions.

In parallel, individual **c3** from Network **N3** follows the acquisition sequence **h, i, j, k** until time $t=4$; after that, driven by the influence of actor **c2** from Network **N2**, **c3** decides to acquire the service or product “**r**”, but instead of abandoning the old network the individual remains in Network **N3** because, for example, the technology already used is compatible with the one used in Network **N2**.

This is just an illustration of the potential to develop dynamic product or service networks capable of tracing behavior and preference changes due to the acquisition of new knowledge. A traced sequence of choices and influences, essential to forecast possible future selections, could be understood by the implementation of *Sequence Segmentation* technologies in e-retail and e-marketplaces IT systems.

13. Contemporary Prediction Methods

Actors simultaneously belong to several different networks, each which contains some aspect of their identity, habits, preferences, personalities and so on. Products, devices, concepts, technologies, fashion items, etc., selected by individuals establish current preference statements and contain traces of potential future choices that could be modified by external influences. The possible future selection is the unknown decision that companies and institutions try to influence. A common way to forecast a possible future preference is by the projection of past preferences and previous trends. The challenge is to determine what individuals would possibly choose in relation to their ongoing preferences, but also, which present choices are the ones that have to be taken into account.

Web-based platforms and e-retail companies suggest new potential interesting products to prospective actors from the information obtained from their accumulated historic browser preferences and navigation habits. The products and digital advertising placed in users’ browsers are customized to each individual from the previous purchases and tracked interests.

Predicting what could be interesting to a person who doesn’t know what to choose or buy is part of the temporary competitive advantage of Web-based companies. E.g., e-retail companies overall offers and promotions take into consideration what others users who have behaved similarly have chosen. Similar products are offered considering similarities with other customers’ preferences of goods, genres, designs, styles, colors, prices, rankings and any other distinctive features. If a person purchases or searches for a specific song or music CD the system will suggest similar options associated with the same music genre made by a comparable customer.

In another example, Netflix uses algorithms to predict which film could be potentially interesting for a user based on such indicators as rankings, past selections, similar movies, behaviors, selections made by customers with similar tastes, and so on. The algorithm is also fed by what the user has browsed and searched for. The recommendation also considers the context from which the selections were made, such as day of the week, time of the day, device and location.

“People rate movies like Schindler’s List high, as opposed to one of the silly comedies I watch, like Hot Tub Time Machine. If you give users recommendations that are all four- or five-star videos, that doesn’t mean they’ll actually want to watch that video on a Wednesday night after a long day at work. Viewing behavior is the most important data we have. We know that many of the ratings are aspirational rather than reflecting your daily activity.”⁴¹

Netflix can’t deliver just Hollywood blockbusters because of the high cost that doing so would entail; instead it offers an alternative potentially interesting film that the user could discover and like. The accuracy of the algorithm relies on the faculty to guess that a person doesn’t know yet that something unseen is actually interesting to watch.⁴²

A progressive improvement in forecasting techniques used by Internet companies that can collect continuous data from users is the consideration of external influences and trends, taking into account how those trends have been shaped as well.

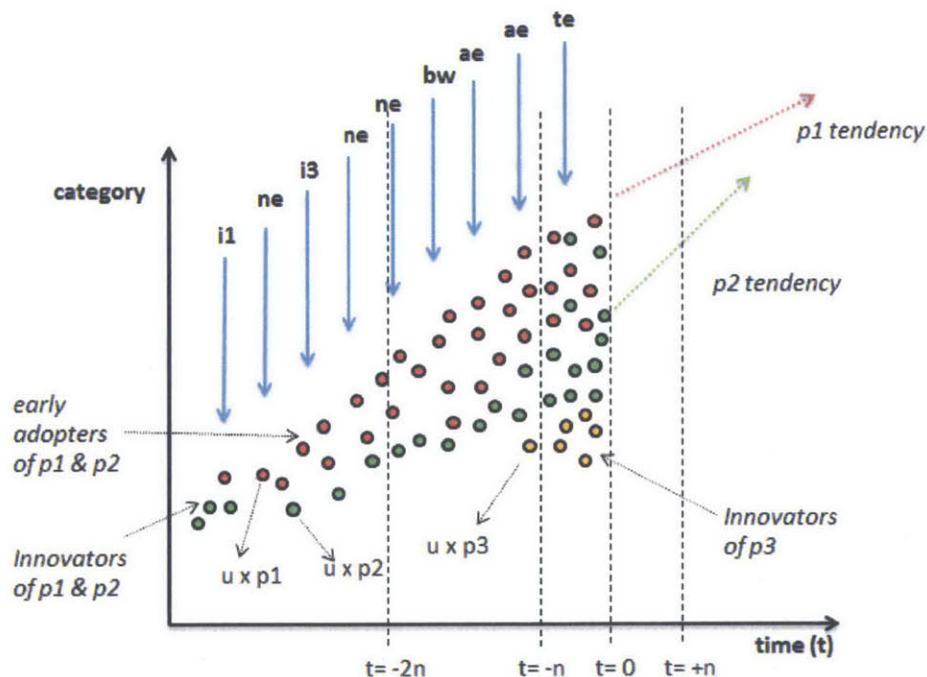


Figure 20. The effect of external influences and new technologies on users

⁴¹ Gomez-Urbe, Carlos, “The Science Behind the Netflix Algorithms That Decide What You’ll Watch Next”, Wired.com, 2013, source: http://www.wired.com/underwire/2013/08/qq_netflix-algorithm/

⁴² Salmon, Felix, “Netflix’s Dumbed Down Algorithms”, Reuters Blog, source: <http://blogs.reuters.com/felix-salmon/2014/01/03/netflixs-dumbed-down-algorithms/>

As is shown in Figure 20, a possible future tendency is predicted from the historic accumulated decisions; each dot represents a selected group of products that belongs to a category that evolves with time.

Even though each historical dot already contains information of the external influences, it is necessary to incorporate the effects that could have shaped the overall preferences. The forecasting outcome can be improved additionally by: an evolutionary analysis of the **Trend Properties**; the application of a **Sequence Segmentation** to understand why, for what, and which actors have changed their preference and product networks; the identification of actors with the highest **Trend Centrality** to predict which actors diffuse the knowledge and who will be affected; and the identification of potential **Network Alteration Effects** to realize the overall causes and effects of the external influences.

For example, before time $t=-2n$, *innovators* and *early adopters* choose 1 of 2 alternatives of some technology standard; the external influence *i1* and *i3* followed by successive network effects generates a higher preference of product *p1* (in red) over product *p2* (in green). Between time $t=-2n$ and $t=-n$ the dominance of *p1* is clear because of a *network effect (ne)*, a *bandwagon effect (bw)* and an *aim effect (ae)*. But later, between $t=-n$ and $t=0$ a *threat effect (te)* is generated due to the adoption from innovators of a novel technology identified as *p3* which changes the previous supremacy of *p1* favoring *p2*.

In this case, external influences created by a potential disruptive technology and other external effects changed the establishment, affecting user's current elections and incorporating new actors. The *threat effect* as the effect generated by a new (in this case a third) element diminished the exclusive loyalty for the dominant technologies contained in *p1* and *p2*.

Digital versus analog photography or dynamic compression in music are examples of changes that impacted established technologies and users, incorporating new alternatives and innovators with novel preferences not previously existing, but that pointed to the presence of a new trend that would have the potential to dominate future choices.

14. New Predicting Methods for E-Retail and E-Marketplaces

Trends as a set of elements that get increasing attention within a network exist through the conscious endorsement of individuals who grant their awareness and interest for the trend pitch.

A trend can be noticed by the observance of networks since a set of connected actors leave traces of their preferences in the systems entered, where the searched, discovered and chosen belong to potential product and category networks that contain the evolution of preferences and necessities.

The degree of disruption of a trend is related to the amount of understandable knowledge that the element, technology or concept is carrying. Understand the origin, nature and circumstances in which a trend is evolving will permit us to forecast what kind of phenomena

caught attention of users, through whom the trend is shaped, expressing the mental state that determines and defines the significance of the trend.

A forming trend is related to the potential future elements that are going to define the features and value proposition of products and services. Because trends have different levels of evolution, an *innovator* or *early adopter* who finds and declares an early and initial preference will reveal information ahead of a potential future tendency. Identifying these users will allow us to approach future preferences of possible future markets. Choices and Web searches leave traces that provide insights of how actors move between *product* and *category networks*, and therefore, allow us to distinguish who are the users who shifted first, differentiating them between *innovators* and the *Lead Users*⁴³ who are the users who have or find necessities in advance before the market, revealing where the market will be directed.

A method to identify trend formations within Web systems requires the distinction and interaction of two network types: a social network that is aware of its social ties; and an implicit virtual network built from similar chosen products, services, categories or interests. Users without formal ties but with similar preferences share elements that correlate them incrementally in relation to the amount of collective elements. A user who is similar to others in terms of preferences but behaves as an *innovator*, *early adopter* or a *Lead User* can be useful to other similar individuals in terms of the knowledge or recommendations capable of delivering

There are different interaction modes among social, products and categories networks:

14.1 1st degree: Micro-scale

The current memberships to product and category networks show the foundational elements that define the fragments of interest and the current preferences of individuals.

The evolutionary and directional changes of product selections indicate the new directions of interests and preferences expressed from the selection of new products, services or categories. A potential new tendency shows several degrees of potential trends in relation to the number of users who enter comparable networks. New preferences will be evidenced by the new destinations individuals move to and by the new connections they consciously or unconsciously establish.

The evolution and changes of category selections show the preference progression of correlated products. If several users' preference pathways end in similar categories, that is an indicator that a set of products or services are canalizing the interest of users, showing the evolution of choices through the relation between current networks and the networks subsequently entered. If no previously related actors or individuals that follow e.g. differentiated technologies moves towards a common one, this indicates the presence of a potential dominant technology that is providing a perceived valid solution to segregated users,

⁴³ Von Hippel, E. (1986). "Lead Users: A Source of Novel Product Concepts," Management Science, 32(7)

revealing *simultaneous* preferences where a common destiny is pointed to at the same time by differentiated networks.

The **permanency** in the category and product network indicates the strength of a new preference or tendency. A low permanency denotes a weak or temporary trend. In parallel, the **level of penetration** of the trend in a network shows how much a group of connected individuals are being affected by the trend and also the relevance and results of potential **external effects**. If the **spread velocity**, as the number of new differentiated followers of a category or product network *per time unit* is growing noticeable and if its **penetration** and **permanency** in social networks is high, the followed product or category should be considered as one that is establishing a trend.

Samples of metrics:

- Preference evolution of products, categories and services types chosen by individuals from Network "x."
- Preferences evolution of individuals from Network "x" who select products, categories and services types from any Network "y."
- Preferences evolution of individuals from Network "x" who prefer products, categories and services types from any other Network.
- Preferences evolution of Actors from Network "x" about specific products, categories and services.
- Preferences evolution of Actors from any Network about specific products, categories and services.
- Preferences evolution of simultaneous Actors of any Network about specific products, categories and services.
- Changes of number of purchases of a product/category/service per time unite.
- New products/categories/services purchased by identified *early users* or *innovators* of other trends.
- New products/categories/services purchased by identified *Lead users* of other trends (future markets).

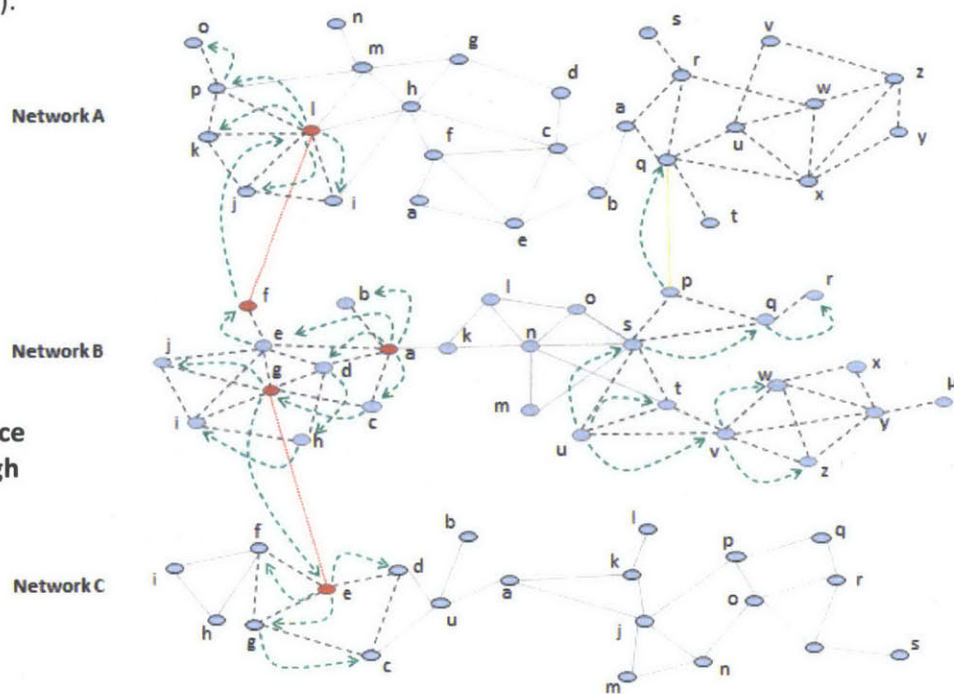


Figure 21. A sequence of influences through networks

For example, as shown in Figure 21, an actor “a” from Network “B” is a first user of a new product. He influences first the actors from the same network who follow him, purchasing the same or similar products. Then actors “f” and “g” from the same Network “B” possess **trend centrality** and establish connections with “l” and “e” from other networks, which then influence actors from their own networks.

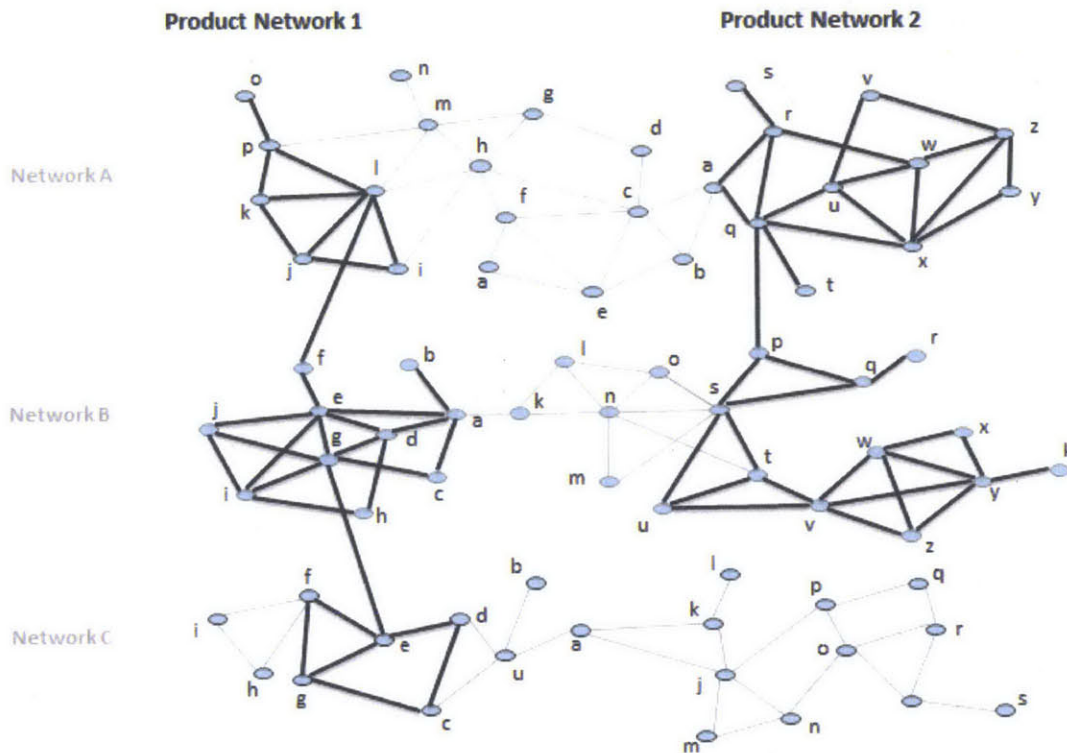


Figure 22. Product networks formation

Subsequently, as shown in Figure 22, the set of influenced actors who purchased the same product or chose the same category or service has a current active interest that establishes a potentially implicit relation between them and therefore a *virtual network* could be defined, one that increase actors’ proximity incrementally regarding the amount of similar preferences chosen.

14.2 2nd degree: Macro-scale

Current overall correlations between individuals concerning cultural, behavioral, historical, values, beliefs, and knowledge aspects delineate the fragments of individuals’ identity. The levels of correlation state different degrees of collective beliefs and contact points that transcend cultural barriers between actors from different origins, cultures, societies, religions and so on. Therefore, a globally accepted and understood product, service or category will be universal and consequently able to be spread from one user to another despite their inherent differences.

The macro-scope source of influences that generate changes and novel directions in users' preferences are among others: society, media, cultural settings, social and civic perceived conducts, regulations, religions, economy, technology developments, and other users. The overall match points among users' preferences will indicate the scope of the shared elements that define the collective implicit network. **The dynamics to observe are:**

The actors' shared factors are the common aspects between actors that allow the transference of concepts, ideas, or elements that will be accepted, distributed and assimilated across different networks without generating conflicts or being affected by individuals' cultural barriers. The universal language recognized by individuals from different networks can be articulated by actors with **trend centrality**.

The identification of the random followers of similar products and categories allows the recognition of collectively attained value features or likewise, the presence of specific *system conditions* that allows the diffusion of trends.

The direction of forces and changes generated by micro- or macro-influences or initiatives originating from the edge or from the center of a system, Figure 23 shows how, for example, a **lead user** can innovate from a product or service, modifying it, and therefore, generate improvements that will affect future versions or create new lines, and then potentially affects an entire community or even a global system. Likewise, a global influence will generate new demands or preferences that will trigger novel technologies, designs, products, and so on.

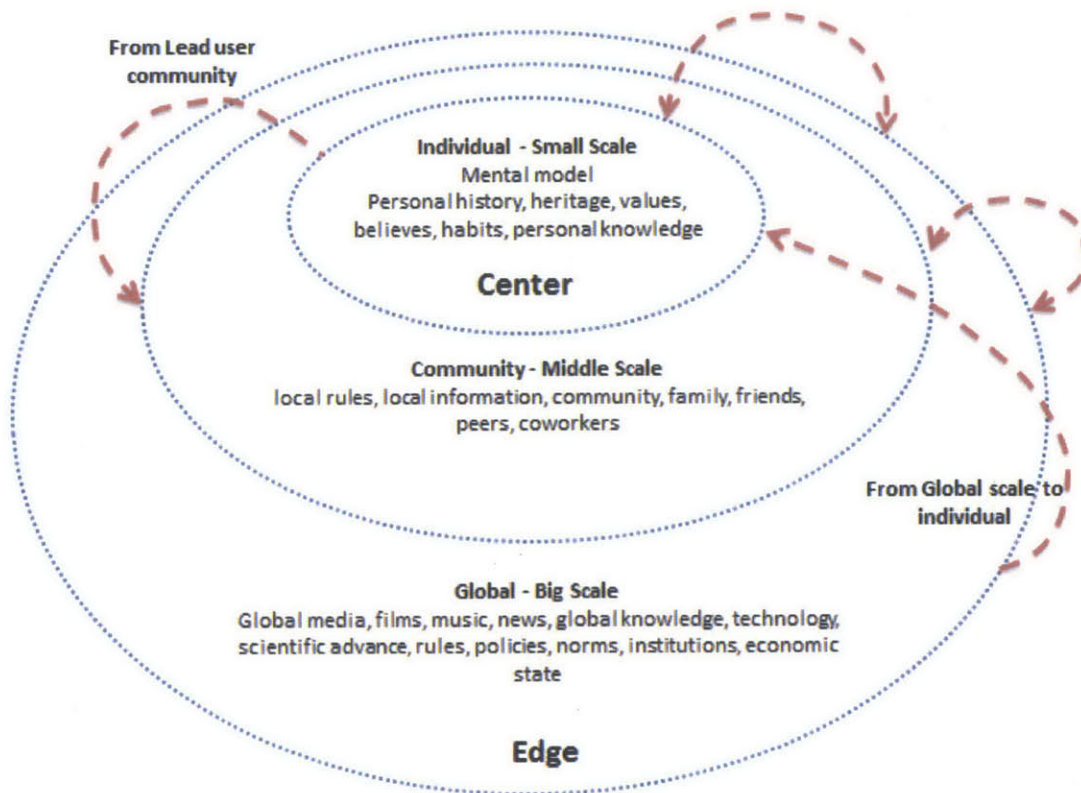
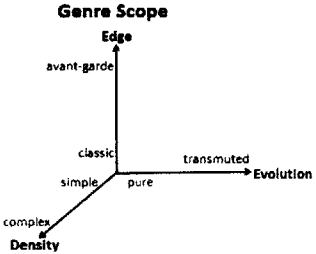
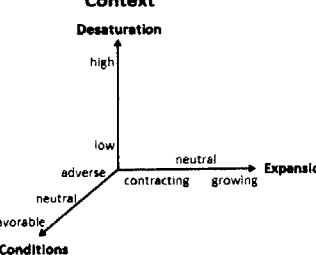
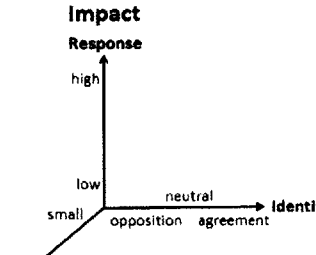
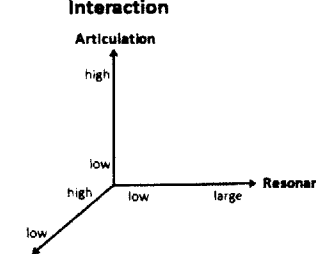
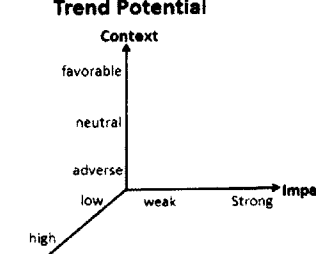


Figure 23. The direction of influences from different scales

14.3 The Trends Properties Table

It is a framework to analyze the factors that shape a trend in a macro- and micro-context, and the potential influence that a trend could exert over individual preferences.

Trends Properties	Factors	Allows to
<p>Genre Scope</p> 	<p>Edge: Level of the vanguard's sophistication.</p> <p>Density: Number of elements that define a trend.</p> <p>Evolution: How much a trend has evolved through time from its original state and source.</p>	<p>Understand how the trend is differentiated among other tendencies. It is the unique position that a trend takes in terms of its design, sophistication, concept, originality and evolution.</p>
<p>Context</p> 	<p>Desaturation: Lack of competing trends.</p> <p>Conditions: Foundation on which the trend is disseminated.</p> <p>Expansion: Supporting elements, the amplifiers or complementors.</p>	<p>Understand if the context will facilitate, amplify or handicap the trend.</p>
<p>Impact</p> 	<p>Response: First reaction of an actor to a trend.</p> <p>Gap: "Cool" new feature, not previously expected by users.</p> <p>Identity: Lasting effect that a trend generates in actors, related to their identity, understanding, values and appreciation.</p>	<p>Understand the perceived trend's empathy and its lasting effects in individuals.</p>
<p>Interaction</p> 	<p>Articulation: Practical contribution or use of the trend.</p> <p>Awareness: Potential use or effect not recognized in the first place but that will affect the future.</p> <p>Resonance: Common element that allows a trend to be understood by several users.</p>	<p>Understand the perceived direct and potential value of the trend by users.</p>
<p>Trend Potential</p> 	<p>If all the properties are favorable the trend will increase its chances of being successful, because the cultural influence, instrumental benefits and attraction that a trend will generate for an individual through a product, concept, service, idea or information carried by others will be high, establishing an element that affects, defines or generates a common desire to be fulfilled by the followed trend.</p>	

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16. Resources Appendix

- Trends Graphs sources: <http://www.google.com/trends/>, <https://support.google.com/trends/>

The numbers on the graph reflect how many searches have been done for a particular term, relative to the total number of searches done on Google over time. They don't represent absolute search volume numbers, because the data is normalized and presented on a scale from 0-100. Each point on the graph is divided by the highest point, or 100. When we don't have enough data, 0 is shown. When comparing two or

more items, bars appear next to the chart. The bar height represents the average of all points on the graph for that search term. Source: <https://support.google.com/trends>

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