

Multi-directional and multi-stage dissemination of Ecuadorian media's news through Twitter during the 30-S.

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Abstract—The development of information and communication technologies (ICT), together with the massive access of people to Internet and online social networks, are changing the communication structure of society. This new social and digital context is changing the way citizens access information. In this paper, we analyze the flow of information emitted by mass media in virtual environments. Specifically, we analyzed the information flow of the two tweets with the highest re-transmission, emitted by two well-known Ecuadorian newspapers (one public and one private), with a large circulation and national coverage, during the events of police insubordination of September 30, 2010. Our results show that the information dissemination network established by these two tweets follows a "swarming" model. That is, multi-directional and multi-stage.

I. INTRODUCTION

From a traditional point of view, the information produced in society is selected, processed and disseminated from the mass media to passive recipients. In this context, media became the exclusive source for the issue of processed information, being the intermediaries between political actors and citizens. The flow of news, in this model, forms unidirectional and unicast diffusion networks. That is, from mass media—which fulfills the role of emitter—processed information travels in different formats: text, audio, or video, to the receiver. In this way, when establishing public opinion, media play a fundamental role in proposing the agenda on which society must debate or think [1]. In that sense, media select news they consider important for society [2].

In the field of mass communication theory, several approaches regarding information dissemination and influence on public opinion are proposed. A first proposal, known as the two-step flow model of influence [3], propose the idea that a small group of media users ("opinion leaders") act as intermediaries between the mass media and its consumers, influencing their opinion. In this sense, the message flows from an emitter (mass media) to the influencer (intermediary) and from it diffuses to the final receivers. On the other hand, the "hypodermic" model [4], states that information flows directly from the communication medium to the receivers. The media

directly "inject" its message to a passive audience, without the presence of any intermediary. This implies that receptors react in a similar way to any stimulus received [5]. In both cases, information diffusion networks and influence networks reach up to two stages from the sender to the receiver. In addition, information flow is unidirectional and the information source is unique throughout the network.

With the advent of digital communications systems and, above all, Internet, the structure of communication systems in society and information dissemination networks have changed radically [6], [7]. Internet has become a network of networks that connects anything (cities, entities, machines, electronic devices, people...) at any place and at any time. This new communication structure has changed the passive role of users of media, transforming them into generators of information products [7].

Thus, the digitization of society has driven the massive generation of data and information; while connectivity has driven the presence of multiple information sources and multi-directional information flows into these networks. Each of the citizens have become active actors in the communication processes and political processes [8]. Thanks to the connectivity and ubiquity provided by communications networks, the Internet, and mobile communications devices, citizens have become generators of information and opinion. Single source and unidirectional information flow networks have been displaced by multi-source and multi-directional information flow networks.

Moreover, the growing interest in online social networks (OSN) is pushing the massification of the dissemination of novel information and diversity of the views of citizens [9]. In this way, OSNs are becoming the medium through which masses can share information (recommendations, opinions, videos, text, and multimedia). However, to date, it is unclear how information flows in this virtual environment.

This paper focus on the particular case of news broadcast on online social networks by newspapers well known in a particular society, in Ecuador, and during a highly conflicting