Computer Networks as the Embodiment of Social Networks: The Role of National Scientific Communities in the Development of Internet in the U.S. and Bulgaria

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ABSTRACT

The Internet, both as a technological system and a set of social phenomena, has global reach. Its development is comparatively recent but the Internet has already become established as an ordinary feature of the everyday activities of people around the world. However, the very familiarity of this information infrastructure tends to obscure important dynamics of the process by which the current state of affairs was reached. This paper is the result of the confluence of two research efforts into the nature of this process in the United States and Bulgaria that began independently. The commonalities and differences between the two cases seemed to present a very compelling case for a comparative case study approach. The United States case had shown that the practice of science and its institutions played a central role in creating today’s global Internet. The world of scientific research, with its institutions, policies and disciplinary distinctions, shaped the network and the way in which it spread to other sectors of society creating the conditions for contemporary activity toward the construction of a national information infrastructure. At the same time, from interviews with the pioneers of Internet in Bulgaria it was found that the Bulgarian scientific community played a key role in establishing the patterns of subsequent development of Internet in the country. In spite of the many obvious differences between the two countries, the two cases reveal a significant common dynamic in the implementation of infrastructural information networks. The first implementation of such a system is a congealed version of certain social networks that deliver the computer network as a by-product of other goals and priorities internal to their existence.

Keywords: Global Reach, Internet, Scientific Communities, Social Networks, Social Phenomena

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INTRODUCTION

The global Internet is already a reality and the excitement about the ways in which education, business, government and many other aspects of social existence may change in the years to come as a result of its impact have already pushed to the background of public interest any questions about how we reached this state of affairs. However, the process of development and implementation of the Internet around the world has been far from a trivial installation of hardware and software to get users connected. There was a very peculiar interplay between the networks of people and institutions involved in the early development of the Internet and the dynamics of its implementation until it reached the operational stability we now take for granted.

In this paper, we take the cases of two countries, United States and Bulgaria, with very significant differences in political organization, culture and technological development and study the process of development and implementation of the Internet. Arguably, the Internet originated in the United States but there is enough evidence to show that the development of the global Internet was far from a one dimensional diffusion process of a bounded, definitive technology available for simple, direct application. The case of the development of the Internet in Bulgaria is an excellent example of this. In many ways, technological developments there were intimately related to prior ones in the United States, via reverse engineering, direct adoption or indirectly through standards policies adopted by government and industry. But these technological interdependencies do not tell the whole story. As we shall see from the presentation of the two cases, there were many similarities in the way networks of people, especially in the scientific community and other research related organizations, carried the process of Internet development and implementation and gave it its first shape as an operational information infrastructure for the country. Many recent studies focus on the effects of existing networks on society. Our approach looks at the social networks that manifested themselves in the development of the information infrastructure. We believe this finding is very important for understanding the nature of socio-technical phenomena in contemporary information or knowledge societies.

The remainder of this introduction addresses three issues: the need to clarify what we mean by ‘internet’; how our approach relates to other approaches in the study of socio-technical systems; and the main features of our comparative case study methodology.

Conceptualizing ‘Internet’ and Its ‘Threads’ of Networking Activity

Although ‘internet’ is a widely used term with a seemingly obvious meaning, the term loses its clarity when defining our aim to trace and compare the role of national scientific communities in U.S. and Bulgaria in its establishment. In general, in a broad sense, any protocol scheme to allow for the interconnection of heterogeneous computer networks is an ‘internet’. However, the interconnection of different sorts of packet switched networks using the TCP/IP protocols in the ARPANET environment since late 1960s was called the “ARPA Internet.” Later all the networks that were interconnected with its implementation became the Internet. Therefore, in a narrow sense, “internet” refers to this particular interconnected system. And the community of users/developers of TCP/IP based networks was then known as the ‘Internet community.’

We will use the broader meaning, because, at least in the U.S., the narrower one points to the subsequent evolution of the initial ARPANET context, even when it transcended the boundaries of ARPA. In the end, both coincide due to the convergence of networking efforts around TCP/IP. The name Internet was then applied to the collection of all those networks reachable on the interconnected system. The community of users/developers grew to include all members of the new component networks and, given
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