

# Chapter 1

## The Transformation of Collective Intelligence

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### ABSTRACT

*Today's knowledge society depends on intellectual capital, that is, collective knowledge and informational assets. Increasingly, the global scene reflects a more interactive mode relative to information, particularly because of social media. As heterogeneous groups bring different expertise and perspectives, their gathered and organized knowledge can lead to more informed decisions and resultant actions. This collective intelligence has been transformed with the advent of easily accessible interactive technologies. This chapter explains collective intelligence and its elements, theories that relate to collective intelligence, conditions for its optimum collective intelligence, and its transformation through digital technology, particularly social media. The chapter also explains human interaction for collective intelligence, and how it can be enhanced through technology, citing several studies.*

### INTRODUCTION

The adage “Two heads are better than one” was never more true than now. The world is changing faster than ever because of social and economic factors, which have been significantly impacted by technology. Today's knowledge society depends on intellectual capital, that is, collective knowledge and informational assets. Increasingly, the global scene reflects a more interactive mode relative to information, particularly because of social media.

As heterogeneous groups bring different expertise and perspectives, their gathered and organized knowledge can lead to more informed decisions and resultant actions. This collective intelligence has been transformed with the advent of easily accessible interactive technologies. This chapter explains collective intelligence, the conditions for its optimum use, and its transformation through social media.

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## **What Is Collective Intelligence?**

Collective intelligence may be defined as “the genuine capacity of a group to think, learn, and create collectively” (Henrichfreise, 2009, p. 102). The adage of “the whole is greater than its parts” intuitively the power of collective intelligence. The underlying concept builds on the idea of social learning.

Educator John Dewey variously discussed the importance of social and collective intelligence as means of the communities having the opportunity to draw upon experiences and individual minds to achieve economic and cultural advancement together, transcending the limitations of any one person (Dewey, 1937). “While what we call intelligence be distributed in unequal amounts, it is the democratic faith that it is sufficiently general so that each individual has something to contribute, whose value can be assessed only as it enters into the final pooled intelligence constituted by the contributions of all” (p. 276).

Vygotsky and Luria (1994) asserted that learning exists first between people and then is internalized. The most common way to learn socially is through collaboration: typically, small groups working together towards a common goal or solution. Other features of collaboration include group and individual accountability, interdependence, distributed leadership, and group autonomy.

Collective intelligence is witnessed in many sectors of society: politics, business, medicine, as well as education. Wikipedia is probably the best known example of collectively gathering, organizing and monitoring expert knowledge from around the world. Google’s translator function encourages users to provide more accurate translations for a given text so that the information can be incorporated into the existing algorithms to improve the tool itself. Genome projects exemplify the impact of collective intelligence as top scientists each contribute their expertise to sequence chromosomes. The SETI Institute searches for extraterrestrial intelligence, leveraging the collective efforts of private members throughout the world. The open-source movement in computer programming makes the assumption that when source code is made available for peers to use and modify, improvements will occur more quickly and efficiently. The Delphi method of structuring expert consensus is used in prediction markets as well as applied research.

Collective intelligence operates on many levels in education: from classroom group projects to site-based curriculum. MOOCs (Massive Open Online Courses) invite widespread participation that can broaden the educational base. Global efforts such as open source journals and open educational resources (OERs) enable practitioners and researchers to share their knowledge, peer-review contributions, and draw upon each other’s expertise.

## **Elements of Collective Intelligence**

Several elements need to be in place for effective intelligence to occur. Tapscott and Williams (2006) identified four underlying principles: openness, lateral collaboration, sharing, and global action. Surowiecki (2004) asserted that collective intelligence combines cognition, cooperation, and coordination. Albors, Romas, and Hervas (2008) listed six variables that need to be considered when facilitating collective intelligence: information, intellectual property, knowledge access, communication, social interaction, and values. Gregg (2010) proposed seven principles for collective intelligence application: task-specific representations, user-added value, data centrality, facilitated data aggregation, facilitated data access, facilitated access for all devices, mentality of continuous change and improvement.

Collective intelligence is implemented through communication and internalization. While an argument may be made that the simple process of externalizing information constitutes communication, the

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