Internet Search Behavior in Times of COVID–19 Lockdown and Opening

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INTRODUCTION

Data Science is a wide field with many different application domains. For example, different applications exist in the field of business and economics (Madaleno et al., 2021). But even beyond that, other fields such as social sciences or medicine do benefit from the power of *big data*. This chapter illustrates a specific use case on how such approaches have been used in the context of the COVID-19 pandemic. This use case illustrates how data science and big data can be used as a powerful instrument to monitor the crisis.

The Corona crisis is a difficult phase for the population of the several affected countries. In particular, first research in the field suggests that symptoms of anxiety and depression, and self-reported stress are common psychological reactions to the Corona crisis (Rajkumar, 2020). It is therefore crucial to further examine the well-being of the population during such a global pandemic crisis.

In this work the authors analyze the online search behavior of the Swiss online population during the COVID-19 lockdown and in particular during the application of the step-wise exit plan of the Swiss Government during summer 2020 before the second wave of October 2020. The authors monitor keywords of different categories such as social and community topics or specific facilities involved in the exit plan.

BACKGROUND

Previous work has shown that online searches for COVID-19 in different countries in Europe are not correlated with COVID-19 epidemiology (i.e. incidence and mortality) but are strongly correlated with international WHO announcements (Szmuda et al., 2020). Also, the well-being of the population has been studied in different contexts, for example by examining the effects of the isolation on the mood and relationships in pregnant women during the Corona crisis (Milne et al., 2020). In another study data from the largest German helpline service were examined, which contacts increased by 20% in the first week of the lockdown (Armbruster&Klotzbücher, 2020). It has also been shown that the lockdown can have an impact on gambling behavior (Håkansson, 2020) or the consumption of pornography (Mestre-Bach et al., 2020). These studies provide interesting insights; however, they do each only cover a rather

small part of the population. In this study the authors cover the entire online population of Switzerland in their data, i.e., 6.9 million active internet users of Switzerland (ITU, 2016), by analyzing the search behavior on a large number of online channels in Switzerland.

A recent study has investigated the information and communication behavior of the German speaking Swiss population during the first phase of the Corona crisis (Friemel et al., 2020). Among their findings is a large trust of the population in the public institutions, including the medical institutions, the Federal Office for Public Health, the Federal Council and also the public media services.

In this chapter the authors will first describe the materials and methods used in this study. Then, the results of their monitoring are presented. In the end they discuss the potential consequences and limitations of this study.

MATERIALS AND METHODS

Research Questions

In this study, the following three research questions have been addressed:

- How does the interest in Corona/COVID-19 evolve over time and what wording is used?
- How does online search for social and community topics evolve during the lockdown and during the implementation of the exit plan?
- How do the measures announced by the exit plan influence the online search for specific facilities?

Each research question was identified by specific keywords in German and French which have been monitored continuously while the lockdown was still on, and first exit plans have been announced by the Swiss public administration. The extracted data shows how often these keywords have been searched for and how this number varies over time, without revealing a single user's identity at any point. It therefore allows to draw conclusions about the whole Swiss population's online search behavior during and after COVID-19 lockdown. It also draws the big picture on how the topics of these days have been understood, adapted and even actively taken up by most of the Swiss internet users. Around 65% of the Swiss population have German as their primary language, whereas 23% speak French as first language.

Methodology

Our methods are based on (Maletzke, 1963) presenting a mass media science communication framework. The framework involves a n-to-n communication from communicators (C), statement or message (S), media (M) and recipients (R). In our case, M=social media, search engines and e-shops, and R=active users doing internet search world-wide. Therefore, our work continuously extends the original stimulus-to-response model, in order to adapt it for online communication.

Data Collection

The method relates to comparisons between the digital content that is offered during Corona times and the content, which is searched for in a defined online universe (mostly on the basis of a country, or on different country domains and where these are missing, based on (ITU, 2016) user data) working with

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