

## ENHANCING THE ROLE OF CITIZEN SENSORS IN MAPPING: COST ACTION TD1202

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### Abstract

This article introduces a strategic initiative, COST Action TD1202, focused on the role of citizen sensors in mapping. It outlines the Action's scope, aims and current status. In particular, the article outlines the potential of citizen science in mapping activities and indicates the scope of current work undertaken by the Action's four working groups. It is stressed that the Action is at an early stage and that it is open to new members.

*Keywords:* Mapping, citizen sensors, volunteered geographic information, COST Action.

## 1 Introduction

Over the last decade, citizen science has grown considerably and is especially evident in relation to geographical information with the rise of the citizen sensor [1]. This paper outlines a strategic initiative funded by the European Union to help enhance the role of citizen sensing in mapping.

## 2 COST Action TD1202

Cooperation in Science and Technology (COST) Actions are a European framework to support research on topics of global relevance. This paper introduces Action TD1202 on 'Mapping and the Citizen Sensor'.

Accurate and timely maps are a fundamental resource but their production in a changing world is a major scientific and practical grand challenge. Citizen sensing has the potential to radically change mapping. The quality of citizen sensor data, however, is variable and activity is often relatively uncoordinated.

This Action will evaluate the utility of citizen sensors in mapping and seek to encourage good practices while not constraining the activity of citizen sensors who often are unpaid volunteers.

## 2.1 Background

Mapping has benefited from recent advances in geoinformation technologies) including citizen sensors fostered by the proliferation of inexpensive and mobile location-aware devices able to provide supporting information (e.g. volunteered geographic information (VGI)) and a general increase in geo-literacy. But the full potential of citizen sensing is unrealized, especially because VGI has quality concerns, notably as sources range from naïve citizens to authoritative, but imperfect, agencies.

The Action aims to better understand the underlying motivation of contributors and to give recommendations on the incentives needed for a VGI project to succeed. Additionally, by bringing together an international team it encourages mobility and knowledge transfer. It began in November 2012 and is scheduled to run to November 2016. It involves 32 countries and welcomes new members (prospective members should contact Giles Foody).

Its central goal is to enhance the role of citizen sensors in mapping. It will review the current status of citizen sensors in mapping, evaluate the strengths and limitations of VGI for key tasks and add value to VGI by indicating its quality and steering activity in constructive ways.

## 2.2. Focus and Organisation

The Action's four working groups focus on overlapping topics.

WG1 focuses on acquiring and managing VGI. It aims to provide an understanding of current practices involving the acquisition, description, storage and distribution of VGI arising from citizen sensors. It has examined the array of terminology related to VGI and summarised the definitions and inter-relationships between the terms to provide clarity. It has also systematically evaluated VGI websites and mobile apps to characterise issues such as: the nature of data sources, the expertise and training of citizen sensors, mechanisms to make VGI available, meta-data provision and if quality control activity. It is planned to run data collection campaigns and to tap into the Action's network, with the data to be available to Action members for further analysis.

WG2 is focused on understanding and influencing contributors. It aims to develop an understanding of citizen sensors and their motivations. It is reviewing the motivation of volunteer types, and how that knowledge can be used to mobilize such groups, and what incentives or rewards are needed to make them contribute optimally and on a sustained basis. It also assesses how VGI campaigns of different types and size are best coordinated, how volunteers are best instructed and trained if needed, and how their contributions can best be assessed and validated. The insights gained should help promote active citizen sensing to meet specific needs.

WG3 addresses citizen sensing in map production. It aims to define the needs of the map producing community, identify the sensitivity and tolerance of mapping methods to different types of error and uncertainty in VGI and assess the potential role of current VGI efforts as well as of active citizen sensing. A survey of key map producers has been undertaken.

WG4 focuses on citizen sensing in map validation. It aims to characterize VGI quality assessment practices, identify the sensitivity and tolerance of different types of applications to different types of error and uncertainty in VGI and assess the potential role of current VGI efforts as well as active sensing. It is reviewing the methodologies used to assess the quality of VGI in several aspects, namely related to the contributor's reliability and traditional aspects of data quality (e.g. positional and thematic accuracy, completeness, currency and logical consistency). This WG will also contribute to the identification of best practices for use of VGI in validation.

## 3. Conclusions

Citizen sensors have considerable potential to aid mapping related applications. COST Action TD1202 seeks to enhance the role of citizen sensors in mapping. Work to-date has focused on reviewing the literature and it is open to new members able to contribute constructively.

## Acknowledgments

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## References

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