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## The application of the CERIF data format to Snowball Metrics

Anna Clements<sup>a</sup>, Brigitte Jörg<sup>b</sup>, Grete Christina Lingjærde<sup>c</sup>, Tomáš Chudlarský<sup>d</sup>, Lisa Colledge<sup>e\*</sup>

<sup>a</sup>University of St Andrews, United Kingdom; <sup>b</sup>Jeibee Ltd, United Kingdom; <sup>c</sup>University of Oslo, Norway; <sup>d</sup>Charles University in Prague, Czech Republic; <sup>e</sup>Elsevier, The Netherlands

### Abstract

The euroCRIS Indicators Task Group aims to develop and share best practice in the use of indicators to support research information management. One of the outputs of the group will be indicators expressed in CERIF that can re-used by CERIF-compliant software services to support consistent measurements for both national and international purposes.

This Task Group will express multiple sets of indicators in CERIF, with Snowball Metrics being the first set to be tackled. The goal of the Snowball Metrics initiative is for research-intensive institutions to share their knowledge and experiences to agree best practice in evidence-based institutional strategic planning. Agreed and tested metrics “recipes”, or methodologies, are shared free of charge with the sector in the Snowball Metrics Recipe Book ([www.snowballmetrics.com/metrics](http://www.snowballmetrics.com/metrics))<sup>1</sup> for use by any organization, whether for public service or commercial purposes.

One of the principles of Snowball Metrics is that they are system-agnostic: in other words, that although particular types of data are needed to support their calculation, the data can come from any relevant source such that the recipes are not tied to any one particular system or supplier of research information. The application of the CERIF data standard to the recipes is an important component in enabling benchmarking between institutions in a system-agnostic manner through the exchange of Snowball Metrics.

CERIFICATION of Snowball Metrics is also expected to facilitate the endorsement of these recipes as global standards. The first set of recipes was agreed and tested by a group of universities in the United Kingdom, but the vision is that Snowball Metrics are supported by universities globally, and that multiple national groups contribute their expertise to agree how best to leverage the institutional and national data sources available, alongside proprietary data sources. The formation of Working Groups and the use of Snowball Metrics outside the United Kingdom demonstrate that the initiative is gaining global traction, and strongly indicate that the needs being addressed are widespread problems for which the sector would like to find a single answer. The universal nature of CERIF provides an important reference point to which it is expected that distinct but equivalent national data sources can be mapped and so used in international benchmarking.

\* Corresponding author. Tel.: +31-20-485-3850  
E-mail address: [l.colledge@elsevier.com](mailto:l.colledge@elsevier.com)

CERIFICATION of the Snowball Metrics is a further example of the accelerating worldwide uptake of CERIF-CRIS Systems by various stakeholders in the research community. In this paper, we will share the progress that has been made, and the lessons learnt, by the Indicators Task Group on applying CERIF to the Snowball Metrics recipes. The pictorial representation of these metrics in CERIF, as well as examples in formal CERIF and CERIF xml, will be shared. We will also highlight the enhancements to the CERIF data model that are being considered that have been uncovered through this work.

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## 1. Introduction

The euroCRIS Indicators Task Group was formed in 2012, with the aim of developing an active programme of research and generation of best practice in the use of indicators for evaluating research, in close cooperation with the Best Practice and Directory of CRIS (DRIS) Task Groups. The output will be CERIF-compliant software services for evaluating research, including methods that are commonly used both nationally and internationally, in collaboration with the CERIF and Architecture Task Groups. Multiple sets of indicators will be expressed in CERIF, so that these indicators can be re-used by CERIF-compliant software services to support consistent measurements.

The first group of indicators to be addressed will be Snowball Metrics ([www.snowballmetrics.com](http://www.snowballmetrics.com))<sup>2</sup>. This is a university-driven initiative that aims to enable informed, evidence-based decision making by agreeing a single method to calculate metrics that provide input to institutional strategies through robust benchmarking. The output of Snowball Metrics is a set of mutually agreed methodologies, or “recipes”, that have been tested for feasibility by the industry project partner in the initiative, Elsevier. These recipes are available free-of-charge in the Snowball Metrics Recipe Book and can be used by any organization for their own purposes, whether public service or commercial, and, if applicable, under their own business models.

Snowball Metrics make use of all data available within a university, whether institutionally-owned, commercially available, or provided by a third party such as a funder, or the Higher Education Statistics Agency (HESA) in the UK. However, one of the principles of Snowball Metrics is that they are system-agnostic, such that although particular types of data are needed to support their calculation, the data may come from any relevant source. This means that the Snowball Metrics recipes are not tied to any one particular system or supplier of research information. It is a vision that Snowball Metrics are implemented in many systems that are built by multiple suppliers, and that research institutions using Snowball Metrics will be able to benchmark themselves against each other regardless of the system they have selected.

This system-agnostic benchmarking will be facilitated by the launch of the Snowball Metrics Exchange API, a free “broker service” that will facilitate the exchange of metrics values from whichever system they have been generated in. The institutional members of the Exchange will be responsible for generating their Snowball Metrics according to the recipes, and can be a member of one or more “benchmarking clubs”, or groups of institutions which have agreed to exchange metrics with each other using the “I’ll show you mine, if you show me yours” approach to exchange equivalent Snowball Metrics. The application of the CERIF data standard to the recipes is clearly an important component of enabling this metrics exchange in a system-agnostic manner.

The goal of the Snowball Metrics initiative is for research-intensive institutions to share their knowledge and experiences to agree best practice in evidence-based institutional strategic planning; as such, there is a clear alignment with the objectives of the euroCRIS Indicators Task Group. This paper will describe the approach taken to CERIFY the original set of 10 Snowball Metrics, and the opportunities that this brings to Snowball Metrics.

## 2. Results

### 2.1 *The principles of CERIFication of Snowball Metrics*

Snowball Metrics represent an agreed and tested consensus between several very successful research-focused universities; the founding university project partners were University College London, the University of Oxford, the University of Cambridge, Imperial College London, the University of Bristol, the University of Leeds, Queen's University Belfast, and the University of St Andrews. The CERIFication is applied to the indicator as defined, tested and published, at policy level by the Snowball Metrics project partners, and the recipes are not modified in any way by the euroCRIS Indicators Task Group.

The CERIFication is carried out on the generic metric definition to ensure global relevance, rather than on the national applications. The aim of Snowball Metrics is that they will become the single method of requesting and consuming information globally, since this will drive enormous efficiencies in all sectors of higher education, and the resources saved can be more efficiently deployed. As such, they should become used not only by research-intensive institutions to provide strategic input, but also by funders, agencies and suppliers of research information globally. Comparable generic approaches to using all available data are being determined to the greatest extent possible to enable global benchmarking, but occasionally it will be unavoidable that there will be national or regional “flavors” to the recipes; the CERIFication is not applied to the national or regional applications, but to the global level.

Snowball Metrics are system-agnostic. This means that although a particular type of data is needed to generate a particular metric, those data can come from whichever data source the research institution has in place, and there is no dependency on any particular system or supplier. Equally, Snowball Metrics can be implemented by any supplier in their own systems, and by any research institution in their own bespoke systems. CERIF is, accordingly, used to describe the data source, but not the methodology that a specific system uses to generate the metric value.

The Snowball Metrics Exchange API will transfer the final calculated Snowball Metric between institutions, rather than the separate components needed to generate the value. For example, when normalizing by full-time equivalent (FTE) count, the normalized value is exchanged, and not the metric plus the separate FTE count from which the recipient would need then to complete the normalization themselves.

### 2.2 *Generic mapping of CERIF to Snowball Metrics recipes*

The Snowball Metrics recipes, as published in the recipe book, follow a consistent structure. The following is not an exhaustive list, but this structure includes:

- The generic definition of the metric
- A schematic illustrating the components that should be plotted on the x- and y-axes of any visualization of the metric
- The denominators at which the metric should be “sliced and diced”

The Snowball Metric recipe structure can be generically translated into CERIF, with the denominators, for example, always being equivalent to “cfOrgunit”. The generic mapping of a recipe into CERIF is shown in Fig. 1.

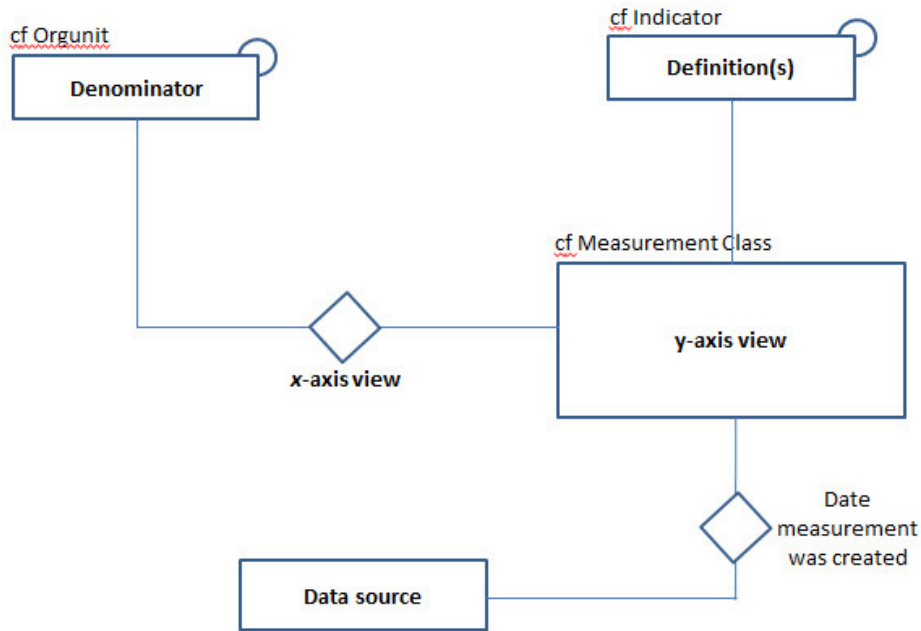


Fig.1. Generic mapping of a Snowball Metrics recipe to CERIF.

### 2.3 CERIFication of the original set of 10 Snowball Metrics recipes

The original 10 Snowball Metrics recipes, published in November 2012, have been CERIFed by the euroCRIS Indicators and CERIF Task Groups. The complete CERIF xml code will shortly be available for download and use from the Snowball Metrics website ([www.snowballmetrics.com](http://www.snowballmetrics.com)), and the code for the new recipes published in this edition of the Recipe Book will be added in due course.

### 3. Discussion

The CERIFication of Snowball Metrics is expected to facilitate the endorsement of these recipes as global standards. Working Groups have now formed outside the United Kingdom, in the United States and in Australia / New Zealand, which demonstrates the global traction that the initiative is gaining, and the global nature of the problems being faced by research-intensive universities for which a single answer would be hugely beneficial. The universal nature of CERIF provides an important reference point to which it is expected that distinct but equivalent national data sources can be mapped and so used in international benchmarking.

The CERIFication of Snowball Metrics is a further example of the accelerating worldwide uptake of CERIF-CRIS (Current Research Information Systems) by various stakeholders in the research community.

### References

1. Snowball Metrics Recipe Book: Their application in The United Kingdom. November 2012. Available from <http://www.snowballmetrics.com/metrics>
2. Lisa Colledge, Anna Clements, M'hamed el Aisati, Scott Rutherford, Project Snowball - sharing data for cross-institutional benchmarking. In: Jeffery, Keith G; Dvořák, Jan (eds.): E-Infrastructures for Research and Innovation: Linking Information Systems to Improve Scientific Knowledge Production: Proceedings of the 11th International Conference on Current Research Information Systems (June 6-9, 2012, Prague, Czech Republic). Pp. 253-260. ISBN 978-80-86742-33-5. Available from:[www.eurocris.org](http://www.eurocris.org).