

<p>Institution: University of Wolverhampton</p>
<p>Unit of Assessment: 36 - Communication, Cultural and Media Studies, Library and Information Management</p>
<p>a. Context</p> <p>The submitting unit, the Statistical Cybermetrics Research Group (SCRG), researches the development new methods to extract data from the web and to analyse web data for social sciences and humanities purposes. Its methods and tools benefit a range of different users and audiences, generating a wide range of different types of impacts. This document describes the most direct impacts. The group aims at impact in several distinct research directions.</p> <p>The development of social science web indicators and web analysis techniques. The core of the SCRG's research in the RAE2008 period was in the development of webometric indicators. This continued in the current period with the development of theory, methods and tools to analyse web phenomena. The main <i>direct beneficiary</i> was Nesta (formerly the National Endowment for Science, Technology and the Arts), who commissioned Webometric reports from the SCRG twice per year for self-evaluation purposes – to help identify the effectiveness of its previous efforts in order to guide its future work. The <i>impact</i> is thus in the approved ability of Nesta to identify useful avenues for its work. UK taxpayers are <i>indirect beneficiaries</i> through improved performance of an organisation funded by them. A second <i>direct beneficiary</i> was the BBC World Service Trust, which commissioned a report to help demonstrate the effectiveness of one of its initiatives. (Indicators case study)</p> <p>The development of web indicators for science measurement. Web indicators for science measurement have been developed by the SCRG by theoretical and methodological <i>research</i> into hyperlink analysis and closely related webometric methods (URL citations, web mentions). The <i>direct beneficiaries</i> of this are science policy-makers and primarily the European Commission's Directorate General for Research & Innovation through a series of contracts with the SCRG. The <i>direct impact</i> is that the Directorate General for Research & Innovation science policy-makers are able to make better decisions about the direction of EU research funding due to the web indicator evidence in reports commissioned from the SCRG. EU citizens are therefore <i>indirect beneficiaries</i> due to more effective use of their taxes and due to the wide variety of impacts generated by the more effectively spent money. (Indicators case study)</p> <p>The development of sentiment analysis methods. Sentiment analysis methods have been researched and developed by the SCRG as part of the CyberEmotions project. The results are encapsulated in the SentiStrength software. The direct beneficiaries are companies using the SentiStrength software (e.g., Yahoo!, Inbenta), and their clients (e.g., businesses, the general public). This has <i>direct impact</i> on the competitiveness of the businesses using SentiStrength by making their services more powerful with sentiment analysis. This also has <i>indirect impact</i> on the users of these companies' products through getting answers to general questions (Yahoo! Answers users) or getting improved customer relations information (e.g., Inbenta clients). (Sentiment case study)</p> <p>The evaluation of scientometric methods for research impact assessment. A small percentage of the SCRG's research has investigated traditional scientometric methods. This has led to policy-relevant findings (e.g., that the impact of collaboration on research productivity is less than previously thought; that interdisciplinary research may be undervalued in research assessment exercises; that alphabetic authorship order in scientific publications occurs to some extent throughout the social sciences and humanities, with an impact on career progression) that have been publicised in the national press (THE articles). The first two of these has the indirect impact that research funding policy makers and research assessors will be more aware of the limitations of collaborative research and the difficulties in assessing interdisciplinary research and hence make better funding allocation decisions. The second adds weight to calls for the abolition of deliberate alphabetic authorship.</p> <p>b. Approach to impact</p> <p>The group's core strategy is to ensure that the research is validated as high quality through publication in top-ranked academic journals, is made available for use as publically as possible for others, and opportunities are sought for exploiting the research commercially, either within the</p>

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team or by others. In addition to this, each of the research directions has a set of specific approaches targeted to develop impact in appropriate ways.

1. For the *social science web indicators and web analysis techniques* research direction the SCRG has formed an alliance with AlterSpark, Canada to share publicity, marketing material, methods and, when relevant work from clients. AlterSpark is the product of former SCRG PhD student Cugelman, and has successfully attracted web analysis contracts from Canadian health organisations, Oxfam and the United Nations. The SCRG supports this collaboration with long term strategic planning and with rapid responses to requests for new methods for AlterSpark clients. The SCRG also advertises its capabilities on the web through sharing its software online. The tools, Webometric Analyst (<http://lexiurl.wlv.ac.uk>, [2,769 software downloads]), SocSciBot (<http://socscibot.wlv.ac.uk>, [1,878 software downloads]), and Mozdeh (<http://mozdeh.wlv.ac.uk>, [150 software downloads]) are available free online via their own websites and are supported by extensive online documentation. In addition, the SCRG has given seminars and training workshops internationally mainly within academia in the belief that education is needed to lead to awareness of the SCRG's methods and that this will lead to wider uptake. This approach attracted start-up company Linkdex in 2008 which led to providing consultancy advice in exchange for 1% shares. Linkdex has attracted almost £3million in investment and is now a successful and multi award-winning business. In recognition that some of the software and methods developed by the group are difficult to use effectively by those unfamiliar with them, yet have potential applications for just such users in other disciplines, the group engages in collaborative research with the objective of ensuring effective use of the methods and tools developed by the group for new applications, helping them to achieve their impacts. In summary, the primary strategy for attracting clients is a joint initiative with AlterSpark and the secondary strategy is online and offline publicity for the value of the web analysis techniques.
2. For the *web indicators for science measurement* research direction the group builds relationships with other research policy teams, such as Idea Consult (Belgium) and CWTS (Leiden), in order to participate in consortia for joint bids for EU contracts. The SCRG policy is for rapid, flexible response to satisfy particular needs of consortia for contracts by temporarily redirecting its research efforts into the problems raised by a contract in order to develop novel solutions. For instance, one contract required the generation of a tens of thousands of email addresses of academics that had moved from Europe to the USA or vice versa and the SCRG developed a new approach to extract this information from the web within two months.
3. For the *sentiment analysis* research direction, the SCRG sells the software online to commercial buyers, provides a free version of its software, SentiStrength, online to researchers and students (<http://sentistrength.wlv.ac.uk/>, [3,375 software downloads and 284 commercial versions emailed free to academics, postgraduates and undergraduates]) as well as demonstrating the methods online and supporting others to extend the capabilities of the software (e.g., for additional languages- it has been used for this in overseas MA projects). In addition the group has given a number of seminars, workshops and short courses on SentiStrength internationally (e.g., Russia, Spain, USA) inside and outside (e.g., Yahoo!, Inbenta, Yandex) of education. These are all attempts to publicise SentiStrength in order to increase its uptake and hence impact. The SCRG also supports clients with upgrades of SentiStrength in order to build a relationship and ensure that SentiStrength fits their needs. For example, a fast interface was built into SentiStrength for Yahoo!'s large data processing needs and Yahoo! was subsequently a partner in two joint funding bids and funded a research project by Paltoglou. Similarly, SentiStrength modifications were made for Inbenta, which has also been a co-applicant in two funding bids. In addition, the group engages in collaborative initiatives aimed at societal impact by harnessing sentiment analysis tools to help media analyses of public events (see the sentiment case study).
4. For the *evaluation of scientometric methods* research direction the impact is indirect, through improved understanding and more effective use of citation analysis methods by practitioners. This is primarily the work of Levitt and PhD student Didegah. Levitt also worked as an applied scientometrician, using his PhD knowledge of scientometrics to conduct contract research for UK universities to help them identify the best research to support. Evidence of impact is a THE article on Levitt's work which showed that the REF could undermine interdisciplinary research ("REF could penalise those working across disciplines", THE, 2 Oct 2008

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<http://www.timeshighereducation.co.uk/403796.article>).

Staff were supported to achieve impact from their research by giving this activity top priority for resources and staff time. In practice, this means that senior staff gave top priority to contract work when it was time dependant (e.g., writing bids for contracts, conducting contracted research), which it almost always is. In addition, senior staff gave top priority to helping junior staff attempting to achieve impact (e.g., through proof-reading proposals for Yahoo! funding and other contract research proposals). During this period, junior staff were promised 50% match funding for impact-driven projects to enable them to develop their own impact agendas. For all types of impact, SCRG senior staff rapidly undertook new research in response to needs identified by clients (e.g., for the email requirement and software modifications mentioned above) and computing equipment was made fully and immediately available for impact-driven work.

The SCRG took advantage of the excellent web hosting facilities at the University for hosting its websites (the group website, 4 software websites), including data and software, which is part of its publicity strategy for identifying potential new clients and impact opportunities. The SCRG also took advantage of the internet infrastructure for its computing equipment, enabling it to collect social web and scientific data almost uninterrupted over the entire REF period. In addition, the group benefited from University initiatives to attract third stream funding, leading to contact with two local businesses needing sentiment analysis solutions. It also benefitted from discussions with University experts over potentially patenting SentiStrength, leading to a decision that this option was not worth pursuing. The University also aided with publicity to local businesses by inviting the SCRG to speak to 50 business representatives at the Wolverhampton Science Park.

c. Strategy and plans

The SCRG plans to continue the strategies described above and to fund a major new strategy, a postdoctoral researcher employed full-time on generating impact. The new strategy is to set up a new group, the **Wolverhampton Research Evaluation Team (WRET)**, led by a postdoctoral researcher to start in February 2014, supported by an existing postdoctoral researcher and including a PhD student, that will have the mission to attract new contracts for indicator applications. The primary target will be Directorate General of Research & Innovation contracts and the primary type of indicator will be web indicators but other contracts will also be sought and WRET will also apply scientometric indicators, when relevant. This initiative will both raise the profile of the group in the marketplace and ensure that more time is dedicated to chasing impact.

Existing impact strategies will be continued and extended as follows.

Publicity The current five websites will be maintained and extended to establish the SCRG as a source of web indicator solutions and to attract new clients seeking the expertise of the group. The group will continue to seek opportunities to present and give workshops and training events inside and outside of academia.

Partnerships The current partnerships with groups that carry out indicator or related contracts, AlterSpark, CWTS and Idea Consult, will be continued and new partnerships will be sought. Partnerships with businesses using SentiStrength (e.g., Yahoo!, Inbenta, Gemius) will also be maintained and new ones sought.

Sales SentiStrength will continue to be sold and the group will proactively start to offer sentiment analysis consultancy: either conducting sentiment analysis on specific sets of texts or customising SentiStrength for specific clients' needs.

Collaborations with other social scientists and humanities researchers The SCRG will continue to respond to opportunities to collaborate with other social scientists and humanities researchers to help them achieve their impacts in a collaborative manner.

d. Relationship to case studies

The indicators case study relates to the *web indicators for science measurement* and the *social science web indicators and web analysis techniques* research directions. The sentiment case study relates to the *sentiment analysis* research direction. In both cases the case studies give examples of direct impact in terms of the use of the group's research by clients of the group.