Zero Proximity:
Increasing the Online Visibility of Academics at the University of Mauritius

François van Schalkwyk

On the airport approach road, an unsubtle pink billboard for T-Systems[1] proclaims: "Zero Distance: The proximity to our customers." T-Systems is not T-Mobile (although they are probably cousins) but such is our neural wiring that the following thought is triggered: "Does anyone still use voicemail anymore?" Although empirical research is thin on the ground, there is evidence that shows that the use of voice-recorded messages on mobile phones decreased by 8% between July 2011 and July 2012.[2] A possible explanation for the decline is the expectation that we are always connected, that we are never really off the grid or disconnected from the network, no matter where we find ourselves. In T-terms, we live in a zero-proximity world. Traditional space-time boundaries have collapsed in a globalised world, and this has garnered an unwavering expectation that any signal to make contact will be returned without delay.

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1 T-Systems is a German global IT services and consulting company headquartered in Frankfurt. It is a division of Deutsche Telekom and provides desktop services, systems integration, computing and network services, and e-business solutions. For their current Zero Distance campaign, see http://zero-distance.t-systems.de/zero-distance/int/en/taking-closesness-to-the-customer-to-a-new-level.html

2 *USA Today*, "Voice mail in decline with rise of text, loss of patience". http://usatoday30.usatoday.com/tech/news/story/2012-09-03/voicemail-decline/57556358/1 [accessed 24 April 2013]. See also http://techcrunch.com/2008/07/05/think-before-you-voicemail/

> " We live in a zero-proximity world. Traditional space-time boundaries have collapsed in a globalised world, and this has garnered an unwavering expectation that any signal to make contact will be returned without delay.

So why bother with a more time-consuming and less immediate attention-grabbing signal like voicemail? Much more efficient to send an email, a text or chat message, ping a friend or even register a missed call, with the certainty that a reply will follow.

Along with the expectation of immediacy, there appears to be a simultaneous increase in the demand for our attention – by the likes of telemarketers, employers, spouses, clients, well-wishers and fraudsters. But what about those on the receiving end of these demands? How do they manage their presence in these ubiquitous global networks? More specifically, presuming academics are not immune to similar demands, how do they manage their presence on the most ubiquitous network of all time, the internet? A network that for them is now instantly and continuously accessible by their geographically distant peers, by research funding agencies, by state funding and evaluation agencies, by industry and by other non-academic knowledge consumers.

The three-year Scholarly Communication in Africa Programme (SCAP), located at the University of Cape Town (UCT) and funded by the International Development Research Centre (IDRC), set out to explore some of these issues. The programme has explored new approaches to increasing the visibility of scholarly communication and functions as the base for scholarly communication research activity in each of the four participating institutions.[3] At one of these sites, the project identified through a series of Cultural Historical Activity Theory (CHAT)-based change-lab workshops that academics in the Faculty of Science at the University of Mauritius felt geographically isolated from their peers, and that this was hampering opportunities for international research collaboration. Compounding opportunities of collaboration are that the University of Mauritius dominates a small national higher education system and that it is a relatively small university and faculty. There are very few academics within its single disciplinary field and this precludes collaboration at the local level, let alone at international level. SCAP posited that

by using internet-based Web 2.0 technologies to increase the online visibility of academics, their chances of gaining access to sought-after academic networks would increase and that this, in turn, would improve the extent to which they collaborated with international academics. Ultimately, the use of online media in fostering new and wider research collaboration would become the norm in academic research and scholarly communication activity systems.

Background and context

Increasing the online visibility of University of Mauritius (UoM) academics through the creation of online academic profiles and bolstering their chances of gaining access to international academic networks should ultimately result in increased knowledge creation, increased knowledge diffusion and greater regional and international research collaboration. These objectives conform to three of the six strategic directions identified by the University of Mauritius. These objectives are also in alignment with government ambitions of creating a Mauritian knowledge economy. It was therefore anticipated that the proposed SCAP intervention at the University of Mauritius would be met with support at all levels within the higher education sector.

Higher education in Mauritius

After a period of consistent growth driven by low-cost labour and low-tech sectors (particularly sugar and textiles) and the highest per capita GDP in sub-Saharan Africa, the Mauritian government embarked on a strategy of diversified production driven by a highly knowledgeable and educated workforce employed in high-technology industries (Bailey, Cloete & Pillay 2011). As an indicator of the progress made in this regard, the Mauritian government reports that the information and communication technology (ICT) sector, a nascent industry until recently, is now the third pillar of the Mauritian economy with a GDP contribution nearing 6.8%, a turnover of USD1 billion and directly employing more than 16,000 people.[4]

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3 Participating institutions are the universities of Botswana, Cape Town, Mauritius and Namibia.

4 http://www.gov.mu/portal/site/telcomit

This strategy resulted in the "one household, one graduate" and "education for the masses" schemes advanced by government which is indicative of the realisation that if Mauritius is to be competitive, innovative and flexible while operating in the global economy, it will need a highly educated citizenry to do so. The vision of the Ministry of Education and Human Resources reads: "A quality education for all and human resource development base to transform Mauritius into an intelligent nation state in the vanguard of global progress and innovation."

By 2009, the gross enrolment ratio (GER) for all levels of education exceeded 75% (UNDP 2009). For higher education, the GER increased from 35% in 2007 to 44% in 2010 (Government of Mauritius 2011).[5]

In terms of the broader definition of the role of higher education in Mauritius, there is a clearly defined role for higher education in the country's national development strategy. This role includes both the production of knowledge and the provision of human capital for economic development within the broader ambition of moving Mauritius towards a knowledge economy (Bailey *et al.* 2011; Van Schalkwyk 2011). Two key national strategic plans in particular reflect this consensus on the role of higher education in national development: (1) the Ministry of Education, Culture and Human Resources' Draft Education and Human Resources Strategy Plan 2008–2020 and (2) the Ministry of Education and Scientific Research's Developing Mauritius into a Knowledge Hub and a Centre of Higher Learning.

At the university level, the objective of development through research and innovation appears strong. This is evident in the UoM's mission statement: "The core mission of the University is the creation and dissemination of knowledge and understanding for the citizens of Mauritius". And in its *2009–2015 Strategic Research and Innovation Framework* the UoM sets

as an objective in its operational plan "to foster research to sustain economic development and growth" (UoM 2009: 33).

It appears therefore that national policy and university policy are in alignment, with a common vision for Mauritius. In other words, there is strong agreement between the government of Mauritius and the UoM of the role that knowledge, and therefore higher education, must play in driving development (Bailey *et al.* 2011; Van Schalkwyk 2011).

Connectivity infrastructure in Mauritius

In order to assess a typical telecommunications network, it can be divided into four parts:

1. international connectivity (typically via fibre-optic cable or satellite)
2. national connectivity (also referred to as the "backbone")
3. the access network or "last mile" connection
4. the organizational network (in this case the on-campus network at the University of Mauritius) (Twinomugisha, in Kotecha 2010).

In terms of international connectivity, recent data show that Mauritius compares favourably with its SADC peers in terms of upload and download speeds (Ookla 2012). However, international comparative capacity shows a marked lag between other countries that have invested in the knowledge economy as a driver of growth and prosperity (e.g. the oft-quoted Finland's average download speed in kbps in February 2012 was 13 times faster than that of Mauritius). Furthermore, Mauritius as an island nation remains dependent on a single cable for its international connectivity in the form of the South Africa Far East (SAFE/SAT-3) cable.[6] This means limited international network redundancy because of the dependence on a single cable for connectivity.

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5   By way of comparison, the higher education participation rates (GER) for Finland and South Korea, two countries with a strong commitment to the knowledge economy, are as follows: Finland 88% and South Korea 85% (Pillay, 2010).

6   The Lower Indian Ocean Network (LION) cable – owned and operated by France Telecom-Orange and its subsidiaries – connects Madagascar, Reunion and Mauritius, but still relies on the SAFE cable for global connectivity beyond the three island nations. LION-2 is planned for Q2 of 2012 and will link Mauritius to the EASSy cable network, which makes landfall in Kenya. See www.cablemap.info/
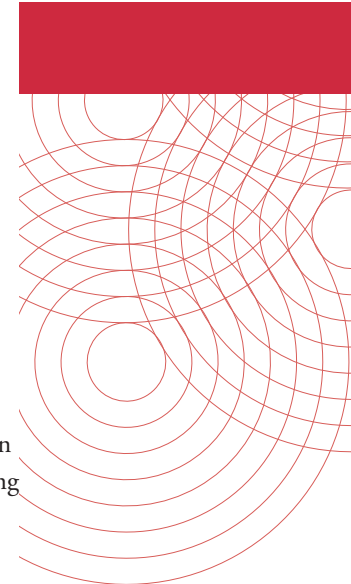
In terms of the national backbone and last-mile connectivity, the Mauritian telecommunications sector is a duopoly of Orange (a subsidiary of Mauritius Telecom) and Emtel. Both offer 3G and ADSL connectivity to their customers.

Initial indications from the change laboratory workshops in May 2011 were that despite favourable access speeds compared to SADC peers, connectivity is problematic at the institutional network level. In particular, the state of e-infrastructure inhibits collaborative research and causes delays in the production and dissemination of scholarly outputs.

Given the current duopoly in the Mauritian telecoms sector and the country's current dependency on the SAFE cable, what is encouraging is the Mauritian government's commitment (at least at policy level as expressed in its National Broadband Policy 2012–2020) "to facilitate the provision of affordable, accessible, universal access to broadband infrastructure and services to promote the social and economic opportunities made available by broadband in order to ensure the best possible conditions under which Mauritius can grow further as a knowledge-based society" (Government of Mauritius 2012: 28). What is less encouraging is the absence of any policy goals to increase access at tertiary institutions – the policy document makes mention of policy goals in this regard at primary and secondary schools but seems to restrict the role of tertiary education to training ICT professionals. This correlates with the claims of the Mauritian government's limited spending on infrastructural development at the UoM (Bailey *et al.* 2011).

Knowledge production at UoM

During the first change laboratory some Faculty of Science (FoS) scholars questioned the need to move to open access publication practice due to the perceived adequacy of their existing publication activity. Many scholars were already publishing in international, high-impact journals in collaboration with international experts. Figure 1 shows the extent of research collaboration using co-authorship of ISI journal articles as a proxy.

There is, however, evidence that some academics in the FoS are already engaged in sharing their work. Subject repositories such as ArXiv have been a part of scientific practice for many years, and disciplines such as astronomy are engaged in large-scale data sharing. Thus, an open approach to scholarly communication has been a part of certain faculty members' scholarly practice prior to the implementation initiative, though they may not have identified it explicitly as such.

Nevertheless, existing collaborative authoring of research is uneven, with 'pockets of excellence', as is the use of open access publishing in what is predominantly a teaching university. Moreover, Mauritius does not compare favourably with other African universities in terms of absolute publishing outputs (Figure 2). When using a weighted measure such as output per permanent academic, data shows that in 2007 UoM academics published 0.13 ISI-indexed articles per annum (Cloete *et al.* 2011). This equates to the publication of one journal article every seven to eight years, and places UoM behind African universities such as the University of Botswana and Makerere University in terms of journal publications per academic per annum.

FIGURE 1 Percentage of publications with international co-authorship for selected African universities (2008–2010)
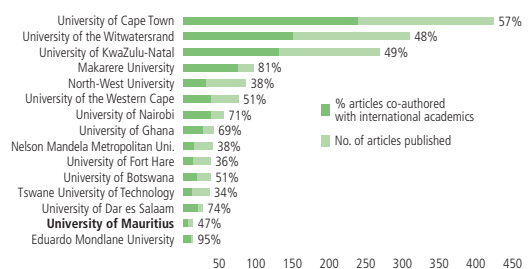
Source: CREST (2012)

FIGURE 2 Publication output at selected African universities (Web of Science 2010)
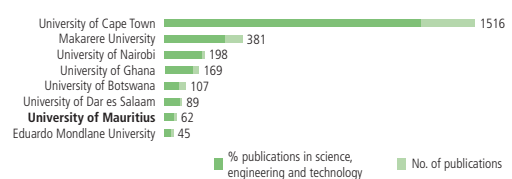
Source: CHET (2013)

Profiles, networks and collaboration

The FoS at the UoM employs a number of internationally collaborative academics, many of them specialists in their respective fields. Due to the low absolute number of researchers, and their divergent academic disciplines, often an individual specialist would be the only local expert in her or his field. Thus, collaborative networks, especially with researchers from Europe, America and India, were both desirable and necessary for academic workflow, especially with regard to multi-authored research publications, a norm in many scientific fields.

It is a truism that collaboration can only occur between two or more researchers; with the advent of digital networks and the impact of globalisation on communication networks (Monge & Contractor 2003), collaboration may also occur between researchers who are not necessarily in the same geographic location. According to Waltman, Tijsen and Van Eck (2011), the distance between collaborators has increased fourfold – from 334km in 1980 to 1553km in 2009. In other words, collaboration (1) occurs across networks of two or more people and (2) may be virtually conducted rather than face-to-face. See Figures 3a and 3b below for a graphic representation of academic collaboration at global level and for Mauritius at regional level, as expressed by the co-authorship of journal articles.

Theories and dynamics of networks in general and communication networks in particular are well documented.[7] Suffice it to say that entry into a network is not always guaranteed or automatic and that networks are typically subject to the dynamics of the status and power relations of their constituents. The chances of gaining access to a network are typically increased if (1) the aspiring entrant is known, (2) has something to offer/exchange (either to other constituents in the network or to the network itself), and (3) can provide tangible, verifiable credentials to confer their perceived value to the network.

The types of possible networks are varied. From an academic point of view, three possible types of academic communication networks are suggested:

1. Academic networks: Academic to academic typically within disciplines for the purposes of knowledge sharing and creation

2. Academic–industry networks: Between academics and industry for the purposes of knowledge creation in the form of innovation

3. Funding networks: Between academics and potential funders of research (e.g. the philanthropies, science councils and national and supra-national agencies)

The status and credibility of academics at UoM within their disciplines was obviously beyond the

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7 See, for example, the work of Bruno Latour, Manuel Castells and John Law in this area. What follows draws on Monge and Contractor (2003).

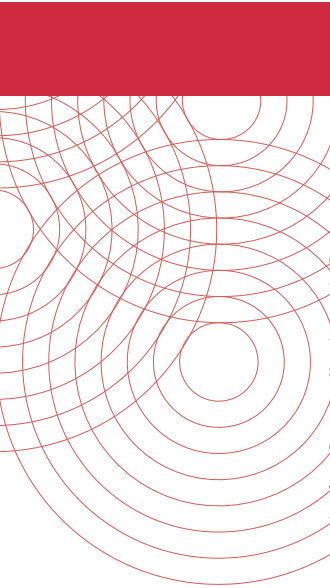FIGURE 3a Scientific collaboration: global perspective
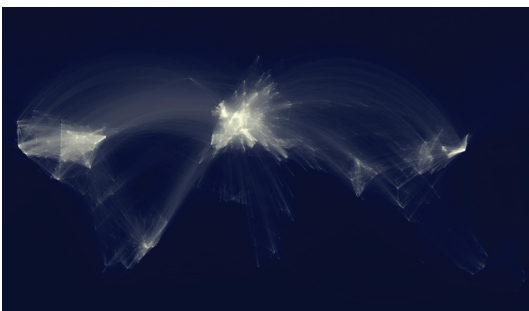
Source: Olivier Beauchesne, Map of scientific collaboration between researchers. http://olihb.com/2011/01/23/map-of-scientific-collaboration-between-researchers/

FIGURE 3b Scientific collaboration: regional perspective
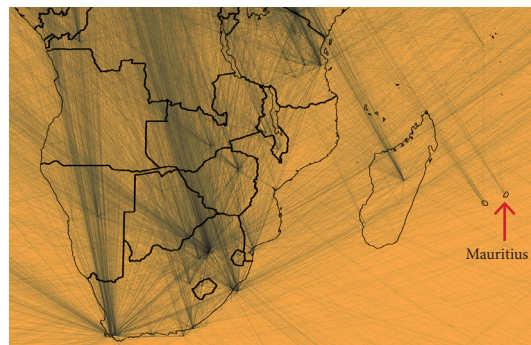
Source: Adapted from Olivier Beauchesne

control of SCAP. However, SCAP is aware that the UoM employs academics that are leaders in their respective fields and sought to assist these and other academics within the FoS (and ultimately across the university) in making themselves more visible online to the three networks identified above. In so doing, the SCAP intervention would increase the probability of academics being accepted into their networks of choice. Once a network has been joined, academics participating in the proposed intervention should *ceteris paribus* be in a position to collaborate more frequently and effectively with other regional and international researchers, reaching a point where collaboration incentivises the maintenance of an effective online presence. Ultimately, this activity will become a taken-for-granted activity in the scholarly communication activity system.

The intervention

Following a series of change lab workshops in 2010 and 2011, it was decided to focus on increasing the online visibility of academics in the FoS at UoM as an intervention that would increase the potential of participating academics to expand their international academic networks and, by implication, to increase international research collaboration. The intervention would therefore be focused on individual academics and on their research activities rather than on the institution.

Online visibility would be enhanced in three ways:

1. Creating online academic profiles
2. Using social media and web technologies
3. Listing publications and other academic outputs online

Existing, free online tools and applications were used in this multi-pronged approach.

In May 2012, academic staff from the FoS were invited to attend a seminar at which they were introduced to various online profiling websites; introduced to the concepts such as 'Web 2.0', 'open access' and 'altmetrics'; briefed on changing patterns in international research collaboration; made aware of the potential value and benefits of

increasing their online visibility; and invited to participate in the initiative. Ten members of faculty signed up to participate.[8] Those who elected to participate were provided with a printed toolkit that set out ten steps to creating an online profile. They were also informed that the SCAP research assistant, based at UoM, would be available to assist them in the process of creating and maintaining their online profiles. The intervention required participants, as a first step, to update their curriculum vitae (CV) as a single reference point for all information uploaded to the various online profiling platforms selected and to make their CVs available to the SCAP research team. Participants were required to make sufficient time available in order to complete a minimum of four of the ten steps in the toolkit.

Participants were asked to have their profiles created by the end of June 2012. Over the six-month period from July to December 2012, participants were expected to update their profiles and to post content regularly (should they have elected to create blogs or Twitter accounts, which were optional). SCAP offered to provide participants with 3G cards for the duration of the project. This was done in order to circumvent connectivity issues from being cited as a barrier to creating and updating online profiles.

Measuring visibility

In July and August 2012 an assessment of the existing online visibility of participants was conducted. This data was used as a baseline against which the progress of the Profiling Academics Online (PAO) initiative in improving online visibility could be tracked. Included in the baseline assessment were: (i) the existence of a personal page on the university website; (ii) existing profiles on LinkedIn, Google Scholar, Mendeley,

8 The initial group of ten was reduced to nine after one of the participants left the university. This may, at first glance, appear to be a small sample but given that it constitutes close to 20% of the faculty staff *and* that those who participated in the initiative were relatively productive in terms of publications within a predominantly teaching faculty, the sample constituted a substantial collection of academics with which to explore the impact of the initiative on a scholarly communication activity system.

ResearchGate, Academia.edu and other discipline-specific online platforms; (iii) the existence of a personal web page or blog; (iv) the number of publications indexed by Microsoft Academic and Google Scholar; (v) the existence of a Twitter account; (vi) participants' position in the results of a Google search of their name and of keywords describing their field of expertise; (vii) H-index scores and number of citations as calculated by Google Scholar and Microsoft Academic.

In December 2012, a second assessment was conducted using the same criteria as in the baseline evaluation in order to establish a change in each participant's online visibility. In addition to recording whether a participant had a profile on a particular platform or not, the December assessment also sought to measure whether there was any online activity during the six-month period.

The findings were presented to the participating academics (and other faculty members) at a seminar in January 2013. At the same time, follow-up interviews were conducted with a selection of PAO participants, as well as with some faculty members who attended the seminars but who did not participate in the PAO initiative.

Findings

The outcomes of the PAO intervention can be divided into four categories: (i) the increase of online profiles; (ii) level of activity in maintaining

online profiles; (iii) the online visibility and completeness of publications; and (iv) discoverability.

In the case of the first two categories, it should be noted that the research team did not have access to the participating academics' online accounts. This placed limitations on the amount of information that could be collected in some instances, and necessitated the use of proxy indicators. Where relevant, these are clearly set out in the findings.

Online profiles

Six possible online profiling platforms were included in the PAO initiative. They were selected based on the fact that these platforms are predominantly aimed at academics or, in the case of LinkedIn, at professionals. Facebook was excluded as it was considered to be more of a social networking platform. In addition, Twitter, blogs and personal home pages were included in the list of possible online technologies that could be used as part of a suite of online media through which content of an academic nature can be shared in order to increase online visibility.

The baseline assessment revealed that seven of the nine participants had LinkedIn accounts. Few or none of the participants had created accounts on any of the other platforms. Following the intervention, the greatest degree of uptake was for Google Scholar, ResearchGate and Academia.edu. There was limited or no uptake in the case of creating a personal web page on the UoM website,

TABLE 1 Change in and percentage of online profiles of participating academics per platform

	UoM	Mendeley	Google Scholar	LinkedIn	ResearchGate	Academia.edu	Twitter	Blogger	Home
CHANGE	0	+1	+5	+1	+4	+4	+1	0	0
JUN 2012	3	0	1	7	2	1	2	0	1
DEC 2012	3	1	6	8	6	5	3	0	1
% prolifes	33%	11%	67%	89%	67%	56%	33%	0%	11%

Mendeley, Twitter, personal blogs or web pages. LinkedIn, Google Scholar and ResearchGate were the three most popular platforms when the final assessment was done in December 2012.

Level of activity

While getting participating academics to create online profiles was key objective, the initiative was also interested to establish (i) whether the creation of an online profile was purely perfunctory, and (ii) whether academics were active on the platforms where they had elected to create online profiles.

In order to assess whether online profile creation was perfunctory or whether participating academics had invested time and effort into creating their profiles, an assessment was done of the extent to which their profiles could be said to be complete. In the case of most online platforms, several steps are required, each step adding additional information, in order to complete the profile in full. However, creating a complete profile is not a prerequisite on most platforms. Two platforms were selected based on the fact that they are both online platforms targeted specifically at academics.

In the case of ResearchGate level of completeness was measured as follows: The profile was considered to be complete if any two of three conditions were met: (1) 100% of Google Scholar listed publications available on profile; (2) following more than 10 people; (3) information for three of the following four fields captured: "About", "Qualifications", "Topics" or "Photo". In the case of Academia.edu, a profile was considered to be

complete if two of the following three conditions were met: (1) 100% of Google Scholar listed publications available on profile; (2) following more than 10 people; (3) information for three of the following four fields captured: "About", "Qualifications", "Research interests" or "Photo".

It was found that of the participating academics with ResearchGate accounts, 75% had complete profiles, while for those with Academia.edu accounts, none of the academics had profiles that could be considered to be complete. Based on this finding, it appears that the participating academics were more inclined to invest time and effort in maintaining their presence on ResearchGate than on Academia.edu.

While creating and maintaining a profile on an online platform increases online visibility, actively adding content or following new users and the content they post further increases such visibility. Three platforms were selected to assess online activity. They included one professional networking platform, one academic networking platform and Twitter. These platforms were selected because they provided enough information to be able to assess activity. The inclusion of Twitter was significant as it was the only platform that required participants to generate content other than profile-related information. Again, a set of indicators were developed to assess levels of activity. For LinkedIn, two criteria had to be met in order for a participant to be considered active: (1) increase in the size of the participant's network on LinkedIn; and (2) their profile had to have been updated in the six-month period. In the case of Academia.edu, the

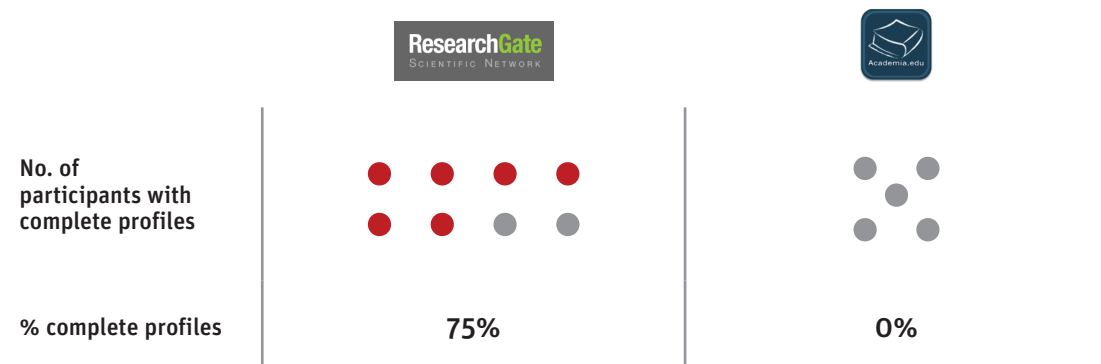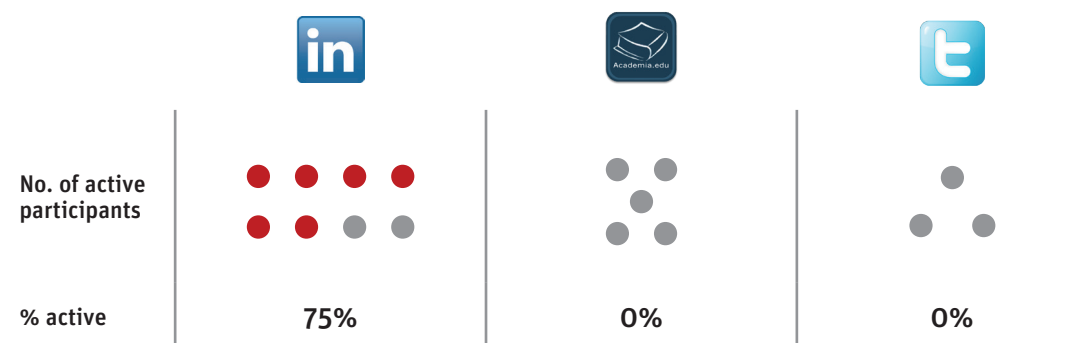**TABLE 2** Completeness of participants' profiles on two platforms

	ResearchGate SCIENTIFIC NETWORK	Academia.edu
No. of participants with complete profiles	●●●● ●●○○	○○ ○ ○○
% complete profiles	**75%**	**0%**

TABLE 3 Activity level of participants' profiles on three platforms

	LinkedIn	Academia.edu	Twitter
No. of active participants	● ● ● ● ● ● ○ ○	○ ○ ○ ○ ○	○ ○ ○
% active	**75%**	**0%**	**0%**

platform itself provides an indicator of activity. If a participant was indicated as active "in last month" on Academia.edu, they were considered to be active. For Twitter, participants with accounts had to have posted content (tweeted) at an average of one tweet per month between June and December 2013.

It was found that three-quarters of participants with LinkedIn profiles were active on LinkedIn during the six-month period. For these academics, an increase in the size of their LinkedIn network was evident, as was the fact that they had updated their profiles after June 2013. In stark contrast, no measurable activity on either Academia.edu or Twitter was found.

Visibility and completeness of publications online

The four most prolific academics from the group of participants in terms of publication output were selected to assess the extent to which their publications were listed online and whether an increase in the listing of their publications (combined with their online profiles) led to an increase in their H-Index scores and number of citations. The determination of which four academics to include in this analysis was done based on the publication lists submitted by the participants to the research team.

A change in H-index scores and number of citations on Google Scholar could not be established as three of the four scholars only created Google Scholar profiles after the baseline assessment. However, Microsoft's academic platform provides H-index scores and citation counts regardless of whether an academic has registered with the service. In all cases there was an increase in both the H-index and number of citations on Microsoft (with the exception of one scholar for whom Microsoft did not return any auto-generated results). In all cases and on both Google Scholar and Microsoft, there was an increase in the number of publications listed for each of the scholars sampled. However,

TABLE 4 Publications: H-index, citations and availability on Google Scholar and Microsoft Academic (MS)

		H-INDEX				CITATIONS				NO. OF PUBLICATIONS				
		Google		MS		Google		MS		Google		MS		Offline list
Participant	Years	May	Dec	May	Dec	May	Dec	May	Dec	May	Dec	May	Dec	
S_1	6	n/a	**2**	n/a	**n/a**	n/a	**10**	n/a	**n/a**	5	**7**	2	**2**	**13**
S_2	9	n/a	**4**	3	**4**	n/a	**28**	28	**34**	6	**9**	15	**16**	**12**
S_3	11	n/a	**19**	12	**12**	n/a	**1,244**	344	**364**	89	**92**	38	**40**	**68**
S_4	15	6	**6**	4	**5**	243	**278**	150	**152**	25	**25**	10	**11**	**20**

in some cases more publications were listed online than were provided in the publications list, while in other instances the publications list supplied by the academic contained more publications than were listed by either Google Scholar or Microsoft.

Whether an increase in H-index scores was a result of an increase of the number of publications available online or due to a natural increase in the number of citations over time could not be determined.

Discoverability

To assess the online discoverability of the participating academics and whether their participation in the initiative led to an increase in their online discoverability, a Google search of their name and surname was conducted during the baseline and final assessments. However, it was decided not to analyse the results of these assessments because it was not possible to determine whether any change was attributable to the actions/activities of the participants or to changes in the way Google generates search results (based on the location of the computer on which the search query is entered, the impact of previous search queries, changes in the Google search algorithm, etc.). Moreover, because the participants had relatively unique names–surname pairings, using their names as search terms is always likely to yield results in which they are highly placed.

During the June 2013 seminar, participants were asked to provide keywords that would best describe their area of academic expertise. Examples included: "biomagnetism modeling"; "supramolecular chemistry"; "optimisation using learning algorithms"; "phylogenetics". During the baseline and final assessments, these keywords were entered into a Google search to assess whether the participant's name would appear on the first three pages of the search results. In neither the baseline nor the final assessment did any of the keywords return results that included the name of a participating academic.

Other findings

During the planning phase of the initiative possible

challenges identified included the commitment of academics in adopting new research activities using unfamiliar technologies within a context of perennial time constraint and poor e-infrastructure (particularly in terms of limited on-campus broadband and outdated software/hardware).

There was no evidence that any of the participants felt intimidated by the technologies to which they were introduced. None of those interviewed stated that they were discouraged to create online profiles because they felt intimidated by the process, nor did any participants express any frustrations in creating their online profiles. The SCAP research assistant did assist several participants in setting up their online profiles, but this appears to have been due to time constraints rather than due to any deficit in technological proficiency. In fact, time constraints appear to be a major impediment to investing time in creating online profiles, maintaining profiles and posting content. Lack of time as a constraint on introducing new activities in publishing activity systems is confirmed by the findings of the SCAP Research Communication Practices Study as well as by other studies of this nature (Brown 2011).

E-infrastructure such as on-campus broadband and computer hardware posed no limitations on participant's ability to create online profiles. While the PAO initiative planned on making 3G cards available to participating academics, these were not issued. At the May 2012 seminar, participants indicated that internet connectivity (both on- and off-campus) was not an issue and that 3G cards were therefore not required.

Discussion

The SCAP PAO initiative set out to increase the online visibility of academics in order to increase research collaboration at the UoM. It was posited that access to and inclusion in global knowledge networks, which is more likely to occur if academics are more visible online, would lead to an increase in international collaboration. In the follow-up interviews conducted with selected members of the FoS at the UoM, several academics expressed the value of networks in their academic

activities. And some, although certainly not all, regarded an online presence as an essential component of the contemporary academic's portfolio. However, the extent to which the profiles created by the PAO participants or the extent to which their online activities directly contributed to accessing new global knowledge networks could not be established. The six-month duration of the initiative was simply too short to yield any concrete results in this regard. Similar interventions followed by regular assessments combined with reliable metrics would need to be conducted to provide reliable evidence of links between online visibility, access to networks and research collaboration.

In his chapter on change in higher education in *The Higher Education System: Academic Organisation in Cross-National Perspective*, Burton Clark (1983) identifies three structural levels of authority in academic systems, each with different predispositions to change: (1) the under structure (the academic disciplines or academic heartland); (2) the middle structure (university governance structures); and (3) the super structure (the state). Two of these levels – the middle and under structures – combine in the organisational form of the university. The third level – the super structure – assumes its structural properties in the form of the state and its apparatuses, and remains a critical component of the institution of higher education.

Putting aside the dynamics and tensions between the three levels of authority, an understanding of the internal dynamics of the under structure according to Clark (1983) provides a useful backdrop to some of the SCAP PAO findings. The under structure consists of the operational units of higher education institutions concerned with the functional preoccupations of universities, that is, teaching and research. These units typically assume the form of faculties, schools, departments or research units. Each sub-unit of the under structure is loyal to its discipline (rather than to organisational collective in the form of the university) and disciplines are loosely coupled to form the academic collective. Change must, according to Clark, be understood within the logic of the discipline. Change at this level of a university therefore flows within disciplines or, if between universities, then within the same disciplinary field.
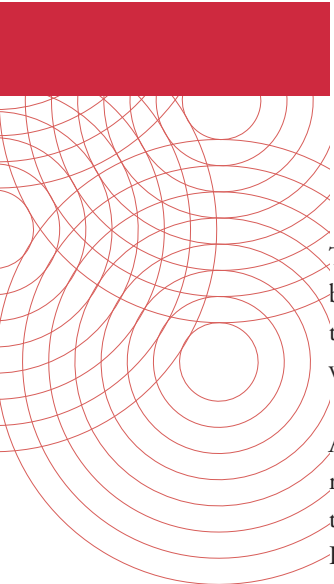
The direction of change is towards loosely coupled, autonomous units and, in effect, disorder. Change is driven by professional influence typically in the form of high-status agents within a disciplinary field or network.

If the SCAP PAO initiative's objective was to introduce change into the activity systems of academics (as opposed to professionals or civil servants or employees) then the specific structural arrangements of the university as a determinant of meaning and resource allocation needs to be kept in mind when considering the extent to which the initiative brought about change. Several of the PAO findings resonate with Clark's formulation of change. For example, the finding that very few of the participants have profiles on the UoM website, and that none of the participants created a profile on the university website but did do so on other online platforms during the six months of the initiative, could be interpreted as indicating a lack of institutional loyalty and a greater degree of loyalty to the participating academics' disciplines.

This interpretation is reinforced when one considers the fact that while the same number of participants created profiles on ResearchGate as they did on Academia.edu, the level of activity on ResearchGate was much higher during the six-month period. While both Academia.edu and ResearchGate are targeted at academics, ResearchGate has a preponderance of its 3 million plus registered academics in biology, chemistry and medicine, disciplines that coincide with those of the PAO initiative participants.

A broader social interpretation of this finding is that new users of an online social media platform are more likely to remain active on such platforms when they are followed by existing users without extended delays and/or when they find it easy to locate other users to follow. In others words, their level of activity is predicated on their ability to create a group or be accepted by existing groups. Most of the PAO participants are therefore both registered and active on LinkedIn because, of the platforms assessed, it has the largest number of registered users. Scale could be seen as a predictor of activity, as is the rate at which someone is able to create their own online network within a platform.
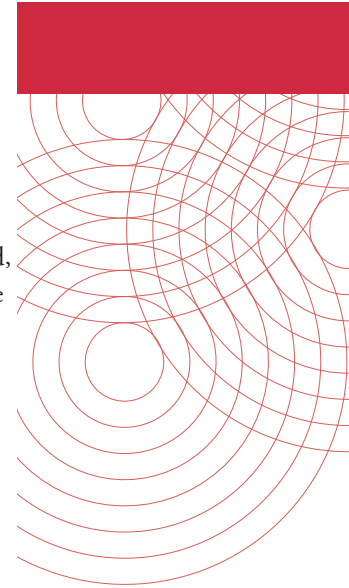
There may well also be a positive correlation between the size of the existing online network and the rate at which a new user makes connections within the existing network.

A second social interpretation is that people are more likely to remain active when there are others to follow who meet certain selection criteria. In other words, while scale and rate of network penetration are predictors of user retention and activity, so are the types (and the number of each type) of user registered on a platform. The fact that ResearchGate has more registered academics from the natural and health sciences on its platform makes it a place where academics from those disciplines are able to make connections more rapidly. Similarly, academics in the social sciences and humanities are well-represented on Academia.edu, and are more likely to find greater traction there. In other words, for academics, the preponderance of other academics in the same discipline as their own is a determinant criterion for level of activity.

Discipline density on online profiling platforms also creates the conditions for creating isolated disciplinary networks or closed, "bubble" networks that are not spatially bound. In addition, lower-status or early-career academics may follow higher-status academics but are unlikely to be followed in return. Others may simply lack the confidence to follow higher-status academics. However, just as academics within certain disciplines may create bubble networks, lower-status or early-career academics may, as a social networking strategy, opt to create secondary networks – networks that are substantive and supportive but that remain outside of the dominant existing networks.

Supportive of the "bubble networks" hypothesis is the fact that there was very low up-take of Twitter, or the creation of personal web pages or blogs. ResearchGate and Academia.edu are academic platforms and LinkedIn is a professional platform – all three have very specific target audiences. Twitter, personal web pages and blogs are more public online platforms with mass appeal. While there could be complex socio-cultural reasons for not wanting a profile that would be too much in the public domain or simple pragmatic reasons (e.g. these tools

are too time-consuming), it could be that POA academics purposively selected the less public of the platforms presented to them, and that they did so because it is easier to create more selective (and isolated) networks on these less public platforms.

What may at first appear to be an exception to the above observation is, in fact, supportive of it. When the project started, only one participant had a Google Scholar profile. Six months later, six of the nine participants had created Google Scholar profiles. One could argue that Google Scholar, simply by virtue of its association with Google and the greater likelihood of a profile being indexed by the Google search engine, is a highly public platform. However, Google Scholar profiles are still academic profiles and pared down ones at that. Furthermore, the platform does not offer the range of social networking tools made available by ResearchGate or Academia.edu. It still offers academics a relatively "safe" and detached online space. Moreover, in the follow-up interviews, participants referred to Google Scholar in functional terms, rather than highlighting the extent to which the platform increased their visibility as academics:

> *I like the Google Scholar. When you search yourself you get your own subject papers. It's useful if you know your papers are being used. […] I like Google Scholar because once they get your name and publication [users] will go for other papers that you published; they add your abstract automatically; it searches for the abstract so you don't have to really go and do the tedious work of getting your soft copy of the abstract, typing it.*

An interview with an FoS academic who participated in all the PAO change labs but elected not to participate in the PAO initiative itself picks up on another dimension contained in the extract above and reveals another potential predictor of activity on online profiling platforms: use value. There could be a host of reasons for this academic's decision not to participate but when asked why he chose not to participate, there appeared to be a reluctance to experiment

with other online platforms. He had been using LinkedIn and ResearchGate for some time prior to the PAO initiative, and did not feel the need to increase his exposure any further through the use of other Web 2.0 technologies. In the interview he stated that he used ResearchGate mainly to make contacts beyond his own department and to access publications (including those of his UoM colleagues). He also viewed ResearchGate as a communal problem-solving platform. He was one of the few who had used ResearchGate to engage other academics to solve a research problem he had been grappling with (in this case, a problem centred on amino acid-derived surfactants). What is potentially interesting to the bubble network thesis is that this academic has a virtually "empty" ResearchGate profile and is followed by only four other academics – all from UoM. In others words, he may well have used ResearchGate effectively to solve a research problem, but has no intention of creating a comprehensive presence of his academic profile on the platform; for him activity is contingent on the value of the tools offered by ResearchGate and not on the potential of ResearchGate to raise his profile online.

In general, it could be said that participants did not have a good understanding of how to construct their profiles in order to maximise their discoverability. The request for keywords on their academic expertise illustrated that the participating academics do not give thought to how other academics might find them online by their area of narrow expertise. This was evident in the fact that the keywords provided were too broad and too generic, and the results of keyword searches in Google failed to include any of the academics in the initiative in the results. One participating academic had created a personal home page on the About.me platform prior to his participation in the SCAP PAO initiative. On his website he included keywords relating to his academic expertise, keywords that differed from those he supplied at the June 2012 seminar. Entering the keywords from this About.me page into a Google search returned this academic's personal web page as the top result. This illustrates how academics need to be strategic about which information they include in their online profiles should they wish to increase their

discoverability through search engines like Google.

In terms of publication visibility, i.e. participants' publications being both discoverable and complete on the internet, a few comments are worth making. First, while there was certainly an increase in the number and discoverability of publications online, particularly on Google Scholar, the process of ensuring a complete list was challenging. Participants were reluctant to share their CVs (which were presumed to contain a list of their publications) with the SCAP research assistant. Whether this was because participants regarded their CVs as private or whether their reluctance was due to their CVs being incomplete was not established. Greater success was, however, achieved when the research assistant requested publication lists rather than CVs. Whether CVs or publication lists, the process of obtaining these documents was a protracted one. Participating academics did not appear to keep up-to-date records of their publications, nor was this information available from the university itself. The reason CVs and then publication lists were requested is that it is assumed that having such an up-to-date offline list serves as a useful reference point for tracking and maintaining online publication lists (which can often be auto-generated by "bots" and require substantial curation). Conversely, not having such up-to-date lists can act as an impediment to creating and maintaining complete and up-to-date publication lists on the internet, particularly given that academics complain of the amount of time it takes to create and maintain such lists.

The publication lists that were made available contained only the most basic of information. The provision of URLs or DOIs of publications already online was patchy and unsystematic. As governments and universities increasingly hold academics accountable and become more sophisticated in tracking the use and impact of scholarly communications, academics will have to improve their efforts in collecting and recording a broader range of bibliographic data. But the onus is not only on the academics – the middle and super structures, which value order and systems, should also support efforts to improve publication data collection: "For institutions to make progress
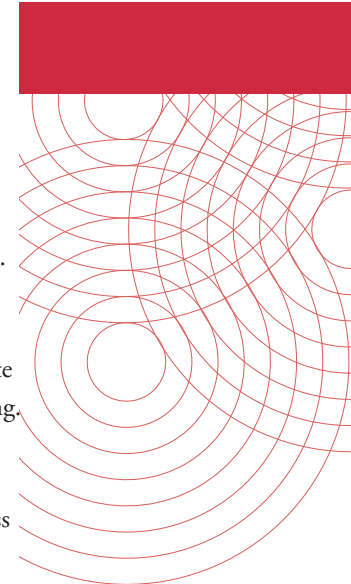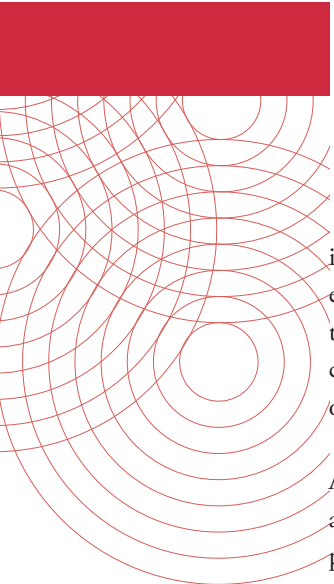
in exploiting the wider range of usage and engagement data currently available they will need to take a much more active role in collecting, collating, and curating data on institutional outputs" (Neylon 2013: 19).

A perhaps more troubling observation was a marked drop in publications of one of the participants, and that this drop appeared to coincide with the academic returning to Mauritius from a university abroad. While abroad, he published more frequently and in collaboration with several international academics. However, after returning to Mauritius and taking up a post in the FoS at UoM, his publication output declined. When interviewed, he complained of a lack of institutional support (mainly in terms of facilities rather than financial) and intradepartmental power struggles, both of which constrained the number of publications he was able to publish. There is undoubtedly much that can be done on the part of academics to improve access to their publications on the internet, but these publications need to be produced in the first place, and universities therefore need to create an environment that is supportive of the research and scholarly communication process.

Conclusion

One needs to remain mindful that the PAO initiative was conducted with a small sample of academics at a single institution, and that, ideally, the intervention would have taken place over a greater period of time. Moreover, the intervention process and metrics used to measure online visibility and activity were deliberately or perhaps inevitably experimental by nature, given the paucity of similar research and initiatives. Nevertheless, the PAO initiative has generated certain insights and tentative deductions that could inform research in this growing area of interest. These include: (i) the potential of improved online visibility to increase the likelihood of gaining access to global knowledge networks; (ii) the disciplinary nature and dynamics that shape online academic communities and determine their successfulness in creating sustainable networks; (iii) the influence that factors such as scale, composition and usefulness have on creating successful online academic platforms; (iv) the use of online academic profiling platforms to create what could be termed "bubble networks"; and (v) individual competencies and tasks combined with the institutional setting as factors influencing the impact of scholarly communications.

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