IT'S TIME TO REPLACE PUBLISH OR PERISH WITH GET VISIBLE OR VANISH: OPPORTUNITIES WHERE DIGITAL AND SOCIAL MEDIA CAN RESHAPE KNOWLEDGE TRANSLATION

[1]Christian J. Barton, [2,3]Mark A. Merolli

[1]La Trobe Sport and Exercise Medicine Research Centre, School of Allied Health, La Trobe University, Bundoora, Australia

[2]School of Health Sciences, Swinburne University of Technology, Melbourne, Australia

[3]Health and Biomedical Informatics Centre, Melbourne Medical School, the University of Melbourne, Melbourne, Australia

Abstract (250 words unstructured)

The 350-year old academic journal model poorly facilitates knowledge translation to healthcare professionals and patients. Current journal formats do not meet the needs of most potential end users – health professionals and patients. Publications are generally produced in formats that do not engage wider audiences beyond researchers. The past 30 years has seen enormous digital technology innovation (e.g., internet, personal computers, tablets, mobile phones, digital publishing, online video and data visualisation, social media) that provides a substantial opportunity to change the model for translation of research to implementation.

Health professionals and patients are using digital and social media to source and communicate new health information at an increasing rate. Therefore, embracing digital and social media to re-shape the knowledge translation path in healthcare has huge potential to improve the efficiency and reach of the current academic journal publication model. This educational review scopes and outlines the current landscape with its limitations, and highlights 5 current opportunities to use digital and social media to reshape knowledge translation in healthcare. We discuss how embracing digital and social media will benefit both researchers and health professionals. A transition from 'publish or perish' to 'get visible or vanish' is inevitable in the academic world. It is time we all embraced it.

Knowledge translation (KT) is defined as "the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health".[3] We acknowledge the growing number of theories, models and frameworks to guide researchers and policy makers on all the complexities of KT.[4] The aim of this analysis is to discuss how journal publishers, researchers and health professionals can use digital innovation (i.e. application of new technologies to existing practices and problems) to re-shape the knowledge translation path in healthcare.

Digital innovation: The application of new technologies to existing practices and problems (e.g. using digital social media to facilitate knowledge translation).

We will outline (i) how digital innovation has already changed journal publishing, (ii) the current digital and social media landscape with its limitations, and (iii) highlight opportunities to reshape the KT path in a rapidly evolving area. We intend to guide journal publishers, researchers and other stakeholders to help ensure they do not become irrelevant in the face of digital innovation.

The lead author of this review recently summarised the 300 year old traditional academic journal publishing process into two broad steps – (i) research completion; and (ii) journal publication.[5] These two steps do not adequately facilitate KT in any discipline. Therefore he proposed two novel steps to improve efficiency and reach by embracing digital innovation were proposed: (iii) multimedia creation; and (iv) social media dissemination (see Figure 1).[5] These digital innovations are not the sole answer to bridging the current evidence practice gap.[1 2] However, based on our analysis, we believe digital innovation has been underutilised in KT, especially when compared to mainstream media. Of note, a number of media organisations have failed or drastically downsized in the past few years. Our 'call to action' to journal publishers and researchers is to ensure they do not let themselves go the same way.

The evidence-practice gap: Estimates indicate it takes 17 years for just 14% of medical research to be implemented.[1 2]

THE INFLUENCE OF DIGITAL INNOVATION ON PUBLISHING TO DATE

Compared to mainstream media, digital innovation has had minimal impact of the academic journal publishing model. Transition from analogue to digital publishing improved distribution (reader/user access), and began to be adopted by most journal publishers in the mid-1990s.[6] This reduced resource and infrastructure costs associated with printing.[7] However, major publishers claim that the costs of digital innovations to improve user experience (e.g. various typeset formats for different devices/operating systems) and reach have prevented them from passing on savings created through digitalisation of production.[7 8] However, data suggest journal subscription costs have increased more rapidly than inflation during the 25 years of digital innovation,[7] and journals are considered highly profitable businesses with profits margins exceeding 30%.[9]

Open Access

Digitisation of academic journal publishing (i.e. moving from 'print' to 'online' and lowering production costs) facilitated the 'open access' model in the late 1990s, with its inherent superior access (free to users) and knowledge translation.[10-12] Online publishing meant production costs could be capped, regardless of how many times an article was viewed or downloaded.[11] This innovation allowed development of a business model where a third party (author, university, grant funder), not the end user/reader, pays article processing charges to the publisher as an alternative to the 'subscription model' where the consumer pays.[11] While some established journals chose not to adopt any form of 'open access', others adopted a hybrid business model where both open access

and traditional 'subscription based' models were combined in an attempt to mitigate the threat that some researchers may stop publishing with them.[13] Interestingly, when comparing 'open access' to 'subscription based' journal models, there does not seem to be a difference in scientific impact measured via citation counts.[13] Additionally, the associated article processing charges of major international publishers of approximately US$3000 per article is a frequent barrier for researchers to publish in 'open access' journals,[7] meaning this innovation is not as effective at improving KT as initially intended.

More recently, new 'for profit' (e.g. Biomed Central) and 'not for profit' (e.g. PLoS) 'open access' journal publishers have emerged. Of particular note, 'not for profit' publishers like PLoS, driven by social innovation,[14] have substantially reduced article processing charges compared to their competitors (generally by > 50%).[7] Co-creation of PLoS with academics allowed the development of innovative ideas to reduce costs through various initiatives, including subsidies from academic institutions and governments, replacing full time Editors with part time Editors or volunteer researchers, and removing processes such as copy-editing which are less relevant for digital compared to print based productions.[7 15]

Despite these innovations by journal publishers and others, there is still a substantial evidence practice gap,[1 2] and consumer (healthcare practitioners and patients) needs remain largely unmet. Numerous checklists exist to ensure the validity of information from clinical trials[16] and systematic reviews.[17] However, these checklists do not cover things like external applicability and consumer involvement well, and do not consider the effectiveness of engagement and dissemination related to the information provided. The lead author of this paper (CB) has been involved in published[18 19] and unpublished research exploring barriers and facilitators to KT for health professionals. Based on this research, we suggest four primary barriers impede KT from academic journal articles, including

access (to non-open access publications), reader comprehension, reader engagement and time required to consume information of text heavy formatting.

4 Primary barriers to knowledge translation from academic journals:

1. Article access
2. Difficulty in comprehension for the reader
3. Lack of reader engagement
4. Time needed to consume text heavy format

IT'S TIME TO RE-SHAPE THE PATH TO IMPROVE KNOWLEDGE TRANSLATION

To improve knowledge translation, we highlight the very useful simple framework of Dan Heath and Chip Heath (2010)[20] in their book titled 'Switch – How to change things when change is difficult'. Their engaging analogy can help us highlight the potential value of digital and social media dissemination to improve KT to the health professional (or patient). It involves considering three broad potential barriers to an elephant rider reaching a destination, which should be addressed where needed:

1. Motivate the elephant = health professional is motivated to offer the most evidence based care they can.
2. Direct the rider = health professional is awaree of their knowledge gaps.
3. Shape the path = access and engagement of KT resources is optimal.

Using this model, we can place the health professional in the place of the rider. Optimistically, we could consider that most healthcare practitioners are motivated and are aware of current knowledge gaps. To date however, we argue that academic journals have poorly facilitated the third consideration, persisting with a text heavy and unengaging format of publishing. Based on the

simple concept of 'Switch', a working group born out of Australia's La Trobe University, called TREK – Translating Research Evidence and Knowledge - has been established to bring like-minded people together to help re-shape the path for KT from academic journals.

TREK's multidisciplinary group uses digital and social media dissemination to facilitate KT to consumers who need it – health professionals and patients, with content customised to the target audience. We propose this approach will better capture the major consumer market by improving access, comprehension, and engagement of content in a more time efficient manner. Ultimately, adding digital multimedia and social media innovation to the academic journal publishing process could build on a currently incomplete KT process (see Figure 1).

HOW DIGITAL AND SOCIAL MEDIA CAN RESHAPE KNOWLEDGE TRANSLATION FOR HEALTH PROFESSIONALS

Social media (including social networks, blogs, media-sharing platforms, etc.) are user-centred internet-based tools that foster online collaboration, sharing, communication, participation and creation of user-generated content.[21-23] Twitter, Facebook and YouTube are currently the most commonly reported platforms used for professional purposes.[24-26] Social media based health research has gradually begun to appear since the mid-2000s, and seen a near doubling year on year based on indexation in PubMed.[27]

Health professionals place a high importance on delivering evidence-based practice (EBP). However, they find themselves with limited resources and/or time to source, critique and apply new evidence with their patients.[28-30] In healthcare, social media can facilitate KT via providing sources of health information, health intervention delivery, health professional networking, disease surveillance, health promotion, and patient communities.[24 28] They offer exciting opportunities to efficiently bring

new research to patient's and health professional treatment rooms through more accessible, timely, and engaging formats.[31]

Sources of information from social media are generally not formally peer reviewed. However, compared to academic journals, information on social media platforms may be considered: (i) easier to access; (ii) more time efficient for the consumer; (iii) more engaging and comprehensible for health professionals and patients; (iv) more rapidly disseminated; and (v) foster better two-way communication between researcher and end-user (i.e. health professionals and patients) (see Table 1).[25]

Table 1 Strengths and weakness of social media and peer reviewed journal articles

	Social Media	Peer reviewed article
Peer reviewed	X	√
Easily accessible	√	Sometimes
Time efficient	√	X
Engaging	√	X
Comprehensible by health professionals and patients	√	X
Rapid dissemination	√	X
Fosters rapid 2-way communication	√	X

Although many health professionals might feel comfortable using social media in their personal lives, professionally they tend to report less confidence.[25] However, according to numerous reports,[24 25 29] health professionals of all ages use social media for professional development, with the highest proportion in those aged 18-34 years. Health professionals reports benefits that include: networking with colleagues or peers, disseminating, sharing and accessing of information in a timely fashion, improving disease-specific knowledge, continuing professional development and medical education,

crowd-sourcing advice and keeping up to date with news and research. Importantly, social media use can lead to intended changes in practice including seeking of evidence and use of EBP, monitoring of patients and greater shared-decision making between patient and health professional. [24 25 29 32 33] These benefits highlight social media's potential in the future of KT in healthcare.

HOW SOCIAL MEDIA BASED KNOWLEDGE TRANSALTION CAN HELP THE RESEARCHER

For individual researchers and their associated institutions, we believe a transition from 'publish or perish' to 'get visible or vanish' is inevitable.[34] Traditionally, an individual's scientific research impact has been measured by citations in other academic publications, i.e. as signalled by the H-index.[33] However, citation counts can be slow to build,[33] and are only a true measure of the research's acceptance or uptake amongst its niche scientific community. What they fail to capture is the impact of the research on the wider KT to the consumer who need it most – health professionals and patients. Notably, societal or real-world influence is inherently difficult to assess.[33] According to a recent mixed-methods study evaluating the potential value of social media to KT,[29] no publication has yet reported the impact of social media on translating research evidence into practice and its effects.[25 29] However, we believe there are at least 5 clear opportunities where digital and social media can help the researcher to improve knowledge translation to healthcare professionals and patients (see box).

5 opportunities for researchers to use digital and social media to improve knowledge translation to healthcare professionals and patients:

1. Embracing social media platforms (Twitter, Facebook, YouTube, etc.) to widely disseminate new and existing knowledge
2. Summarise key research findings into more engaging written content and publish on trusted blogging platforms (e.g. BJSM blog site)
3. Production of audio podcasts to provide the consumer with researcher and expert insights into how to apply evidence in clinical practice
4. Production of visually engaging summaries of research to improve the efficiency of knowledge translation and retention (e.g. infographics) to healthcare professionals and patients
5. Production of video content to summarise research findings and guide 'how to' implement evidence into practice

Since 2011, there has been an impetus to include social media as a new source of research impact data – not to be seen as a replacement, but to complement traditional publication practice and metrics.[32 33] Twitter has been the most researched medium in the digital KT space from the perspective of its complementarity to citation indices, as well as use in online journal clubs.[32 33] This is not exclusive though, and a similar methodology can be applied to other popular social media, such as Facebook.[29 33] Impact is currently measured through the social media footprint – e.g. what content has been searched for, tagged, shared, and mentioned.[33] Research exploring this practice is still relatively in its infancy and questions outweigh answers. For example, do the research impact metrics available through social media correlate to traditional citation metrics? Is it traditional citations that generate social media chatter or, vica-versa?

An immersive discussion about all forms of social media is beyond the scope of this piece. However, two freely available and popular options are worthy of mention due to their popularity among health professionals – Twitter and Facebook.[25] Both Twitter and Facebook can help researchers, or a journal draw attention to newly published work with immediacy. When comparing which site promotes greater content sharing amongst colleagues, there is a paucity of research which has compared the two. Findings from Tunnecliff et al[26] did indicate limited evidence that Twitter may be

better in this regard. However, more research is needed in this area, and it is likely to depend on the target audience's preferences. It has also been postulated that there is a correlation between journals with an active Twitter profile having a higher mean impact factor.[32] However, the 140-character limit has previously made it hard to provide informative messages beyond one key point in most instances. Interestingly, this may no longer be as big a barrier. Twitter is no longer counting media attachments and usernames replied-to in character counts, and posts can easily link to more detailed contents housed on blogging, video or podcast platforms. Facebook allows for up to 60,000 characters per post and may be preferable to explore due to its more than 1.7 billion active Facebook users each month (continuing to rise), unlike Twitter's stalling 313 million.[35] This growing gap in user numbers may be particularly relevant for KT to patients.

There are several other social media platforms and content types suited to facilitating KT, including blogs, podcasts, infographics, and video.[22 23 27] Blogging inherently presents a less scientific rhetoric without the same peer-review process of traditional academic articles. However, this makes it well suited to presenting content in a more succinct, digestible and engaging format, with readily accessible inexpensive or free blogging platforms, such as WordPress now able to easily embed other multimedia like video and audio.[22] Podcasts may offer a similarly attractive format for content delivery in this context, allowing KT through expert commentary and research summaries via easy to access audio channels (including smart phones).

A further consideration for digital KT is 'visual imagery'. Graphs, images and infographics all have the ability to complement well written messages to optimise engagement. Yet, in academic journal articles, the number of figures is frequently limited, creating a barrier to engaging the end user. Additionally, creating a figure for knowledge translation may require different formatting and size (e.g. infographic) to a traditional data figure – to date most journals have not offered to take that

cost to their side of the ledger. Impactful infographics typically take just 2 to 3 minutes to digest, which is a significant improvement on the time burden needed to read and comprehend a lengthy journal article of a few thousand words.[36] Content presented in a visual format has hence been known to be more engaging and retained compared to text-based information.[36 37] We encourage institutions and research teams to ensure current and future researchers develop the required skills to produce digital KT resources like infographics. Although this training and time needed to produce KT resources, or costs of outsourcing production in parallel to traditional academic papers may add to the cost of research completion, it may be essential to optimise research impact.

Like infographics, video based content is also highly engaging, and most commonly published and viewed on YouTube.[22] One report even suggests that video is 6 times more likely to be shared (retweeted) than stand-alone images.[38] Additionally, It is hypothesised that by 2018 video will account for around 80% of all internet traffic,[39] highlighting its current and future potential for KT. It is time for researchers and journals to embrace the use of video to summarise research findings via author interviews, animations, and other formats to ensure research impact and knowledge translation is optimised. Additionally, video also lends itself well to provide 'how to' guidance on implementing research into practice. Like other visually engaging resources like infographics, the challenge will be identifying who covers the added cost of video content creation. Regardless, embracing video and other KT resources will significantly enhance the visibility of research findings to the consumer, particularly health practitioners and patients.

LIMIATIONS, CHALLENGES FUTURE CONSIDERATIONS

Social media offers vast possibilities to KT in healthcare. However, ongoing concerns exist regarding their alignment to evidence based practice and academic rigor, including: reputability of

information, accuracy of content, privacy of individuals, and professional obligations for use.[24 25] This may also have to do in part with social media having created a paradigm shift, and challenging the status quo.[29] Regardless, best practice for digital KT may be assisted in future with greater focus on governance and standards for quality controlled websites and platforms maintained by our various professional regulatory bodies, academic journals, as well as training of health professionals on the use of social media.[25] We also encourage the establishment of peer review systems for resources such as infographics, videos and podcasts to ensure the validity of information shared on social media.

Using digital technologies and social media to facilitate KT remains a niche and under researched area. As such, reviews about social media based KT are still relatively few. The research landscape is in its infancy and currently faced with limited evidence of the impact of social media use in this space, and how best to harness its potential value. Key considerations noted from the current social media KT research available[24 25 29 32 33] must be considered in light of a number of limitations, including:

- Studies examining social media use by health professionals have examined relatively small sample sizes
- Many have studied primarily effects on physicians, and not a broad range of health professionals
- Most research has been conducted on already active online health professionals, biasing towards self-selecting likely social media users
- There is a bias towards journals that publish about the Internet and technology
- Much of the research also comes from a digitally enthusiastic community (i.e. Journal of Medical and Internet Research)
- Twitter activity can be skewed by journals with a strong social media presence and strategy

There are now useful ways to examine social media footprints with traditional metrics like article citations.[33] However, the influence of social media on more real-world indicators, such as professional practice, patient outcomes and attitudes towards healthcare is yet to be adequately evaluated. Healthcare is not like other industries. Whilst popularity might be a useful gauge in a commercial sense, it is fraught with danger in health if not considered in conjunction with a raft of other factors and analytics.[33] At this stage, we would be wise to consider social media metrics about research impact as a measure of awareness or attention about specific research, not overall societal impact and implementation. However, it may be a useful next step if we were to suggest that attention about an issue is a requisite for change.[33]

CONCLUSION

Improving KT from healthcare journals is a burgeoning and important challenge for publishers, authors, their institutions and individual health professionals. In this sense, improving patient care relies on success in endeavours within this space. To date, digital innovations embraced by publishers such as transition from analogue to digital publishing and the development of open access journals has done little to improve KT. Moving forward, embracing digital multimedia and social media innovation to re-shape the translation path is needed by all involved. There will be no 'one size fits all' model, and resource needs are likely to vary depending on the individual, type of knowledge, and the context or environment in which it will be consumed. New digital innovations to facilitate KT are inevitable, and will need to be embraced in the future. This review has provided an in depth look at the area of KT and the role social media currently plays and may continue to play in the future of the practice. Several challenges lie in wake, and the current landscape raises several questions. However, the future for this space is exciting and littered with possibility for those willing to innovate. Regardless, the ultimate aim of digital and social media use in KT is to reduce the

evidence-practice gap. If we keep this central thesis forefront, we have a greater chance of succeeding in this practice. A transition from ‘publish or perish’ to ‘get visible or vanish’ is inevitable in the academic world. It is time we all embraced it.

References

1. Grimshaw JM, Eccles MP. Is evidence-based implementation of evidence-based care possible? Med J Aust 2004;**180**(6 Suppl):S50-1.
2. Morris ZS, Wooding S, Grant J. The answer is 17 years, what is the question: understanding time lags in translational research. J R Soc Med 2011;**104**(12):510-20.
3. Organization WH. Bridging the "Know-Do" gap: Meeting on knowledge translation in global health. 2005. https://www.measureevaluation.org/resources/training/materials/high-impact-research-training-curricula/bridging-the-know-do-gap.pdf/view (accessed 30th December 2016).
4. Nilsen P. Making sense of implementation theories, models and frameworks. Implement Sci 2015;**10**:53.
5. C B. The current sports medicine journal model is outdated and ineffective. Where to next to improve knowledge translation? . Aspetar Sports Med J 2017;**6**:58-63.
6. Ebbesson E. Fragmented digital infrastructures: The case of social (news) media. Journal of the Association for Information Systems 2015;**e-Biz**:31.
7. Solomon D, Björk B-C. A study of open access journals using article processing charges. Journal of the American Society for Information Science and Technology 2012;**63**(8):1485-95.
8. Creagh S. Open access access and academic journals: The publishers respond. 2011 Aug 11, 2011. http://theconversation.com/open-access-and-academic-journals-the-publishers-respond-2804.
9. Larivière V, Haustein S, Mongeon P. The Oligopoly of Academic Publishers in the Digital Era. PLoS One 2015;**10**(6):e0127502.
10. Oppenheim C. Open Access and the UK Science and Technology Select Committee Report Free for All? Journal of Librarianship and Information Science 2005;**37**(1):3-6.
11. Eysenbach G. 10 years experience with pioneering open access publishing in health informatics: the Journal of Medical Internet Research (JMIR). Stud Health Technol Inform 2010;**160**(Pt 2):1329-33.
12. Björk BC. A study of innovative features in scholarly open access journals. J Med Internet Res 2011;**13**(4):e115.
13. Björk BC, Solomon D. Open access versus subscription journals: a comparison of scientific impact. BMC Med 2012;**10**:73.
14. Baltazer Herrera M. Creating competitive advantage by institutionalizing corporate social innovation. Journal of Business Research 2015;**68**:1468-74.
15. Voorberg W, Bekkers V, Tummers L. A systematic review of co-creation and co-production: Embarking on the social innovation journey. Public Management Review 2015;**17**(9):1333-57.
16. Eldridge SM, Chan CL, Campbell MJ, et al. CONSORT 2010 statement: extension to randomised pilot and feasibility trials. BMJ 2016;**355**:i5239.
17. Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. J Clin Epidemiol 2009;**62**(10):1006-12.
18. Rowe V, Hemmings S, Barton C, et al. Conservative Management of Midportion Achilles Tendinopathy A Mixed Methods Study, Integrating Systematic Review and Clinical Reasoning. Sports Medicine 2012;**42**(11):941-67.
19. Barton C, Hemmings S, Morrissey D. The influence of published evidence on physiotherapists' clinical reasoning when treating patellofemoral pain syndrome: a mixed-methods study. J Orthop Sports Phys Ther 2012;**42**:A49-50.
20. Heath C, Heath D. *Switch: How to Change Things When Change Is Hard*. London, United Kingdom: Random House Business Books, 2010.
21. Cheston CC, Flickinger TE, Chisolm MS. Social media use in medical education: a systematic review. Acad Med 2013;**88**(6):893-901.

22. Kaplan A, Haenlein M. *Users of the world,unite! The challenges and opportunities of Social Media* Business Horizons 2010;**53**(1):59-68.

23. Van De Belt T, Engelen L, Berben S, et al. Definition of Health 2.0 and Medicine 2.0: a systematic review. Journal of Medical Internet Research 2010;**12**(2):1-14.
24. Alsobayel H. Use of Social Media for Professional Development by Health Care Professionals: A Cross-Sectional Web-Based Survey. JMIR Med Educ 2016;**2**(2):e15.
25. Tunnecliff J, Ilic D, Morgan P, et al. The acceptability among health researchers and clinicians of social media to translate research evidence to clinical practice: mixed-methods survey and interview study. J Med Internet Res 2015;**17**(5):e119.
26. Tunnecliff J, Weiner J, Gaida JE, et al. Translating evidence to practice in the health professions: a randomized trial of Twitter vs Facebook. J Am Med Inform Assoc 2016.
27. Grajales F, Sheps S, Ho K, et al. Social Media: A review and tutorial of applications in medicine and health care. Journal of Medical Internet Research 2014;**16**(2):e13.
28. Glasziou P, Haynes B. The paths from research to improved health outcomes. ACP J Club 2005;**142**(2):A8-10.
29. Maloney S, Tunnecliff J, Morgan P, et al. Translating Evidence Into Practice via Social Media: A Mixed-Methods Study. J Med Internet Res 2015;**17**(10):e242.
30. Dijkers MP, Murphy SL, Krellman J. Evidence-based practice for rehabilitation professionals: concepts and controversies. Arch Phys Med Rehabil 2012;**93**(8 Suppl):S164-76.
31. Baldwin M, Spong A, Doward L, et al. Patient-reported outcomes, patient-reported information: from randomized controlled trials to the social web and beyond. Patient 2011;**4**(1):11-7.
32. Roberts MJ, Perera M, Lawrentschuk N, et al. Globalization of continuing professional development by journal clubs via microblogging: a systematic review. J Med Internet Res 2015;**17**(4):e103.
33. Eysenbach G. Can tweets predict citations? Metrics of social impact based on Twitter and correlation with traditional metrics of scientific impact. J Med Internet Res 2011;**13**(4):e123.
34. Doyle J, Cuthill M. Does 'get visible or vanish' herald the end of 'publish or perish'? Higher Education Research and Development 2015;**34**(3):671-74.
35. Statistics and facts about Social Networks. Secondary Statistics and facts about Social Networks 2016. https://www.statista.com/topics/1164/social-networks/.
36. Ahmad I. What Makes Infographics Go Viral [Infographic]. Secondary What Makes Infographics Go Viral [Infographic] 2016. http://www.socialmediatoday.com/social-business/what-makes-infographics-go-viral-infographic.
37. Krum R. *Cool Infographics: Effective Communication with data visualization and design*. Hoboken, NJ: Wiley, 2013.
38. Hutchinson A. Images, GIFs or Video – Which Generates the Most Response on Twitter? Secondary Images, GIFs or Video – Which Generates the Most Response on Twitter? 2016. http://www.socialmediatoday.com/social-business/images-gifs-or-video-which-generates-most-response-twitter.
39. White paper: Cisco VNI Forecast and Methodology, 2015-2020. Secondary White paper: Cisco VNI Forecast and Methodology, 2015-2020 2016. http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/complete-white-paper-c11-481360.html.