Trademark Trial and Appeal Board Electronic Filing System. http://estta.uspto.gov

ESTTA Tracking number: **ESTTA1007902**
Filing date: **10/09/2019**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Notice of Opposition

Notice is hereby given that the following party opposes registration of the indicated application.

Opposer Information

Name	Alexandria Real Estate Equities, Inc.
Granted to Date of previous extension	10/09/2019
Address	26 North Euclid Avenue PASADENA, CA 91101 UNITED STATES

Attorney information	HOWARD S. HOGAN GIBSON, DUNN & CRUTCHER LLP 1050 CONNECTICUT AVE, NW WASHINGTON, DC 20036 UNITED STATES pto-oc@gibsondunn.com 2028873640

Applicant Information

Application No	88284758	Publication date	06/11/2019
Opposition Filing Date	10/09/2019	Opposition Period Ends	10/09/2019
Applicant	Bugsby Property LLC 1209 Orange Street Wilimgton, DE 19801 UNITED STATES		

Goods/Services Affected by Opposition

Class 045. First Use: 0 First Use In Commerce: 0 All goods and services in the class are opposed, namely: Online social networking services

Grounds for Opposition

The mark is merely descriptive	Trademark Act Section 2(e)(1)
The mark is generic	Trademark Act Sections 1, 2 and 45

Attachments	Notice of Opposition for INCLUSIVE INNOVATION Class 45 final.pdf(133693 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 1.pdf(2698858 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 2.pdf(1011208 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 3.pdf(398063 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 4.pdf(1328336 bytes)

	Opposition INCLUSIVE INNOVATION Class 45 Exhibit 5.pdf(451121 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 6.pdf(644765 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 7.pdf(1300727 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 8.pdf(1200669 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 9.pdf(237096 bytes) Opposition INCLUSIVE INNOVATION Class 45 Exhibit 10.pdf(1639376 bytes)

Signature	/howard s. hogan/
Name	HOWARD S. HOGAN
Date	10/09/2019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

In the matter of application Serial No. 88/284,758
For the Trademark INCLUSIVE INNOVATION
Published in the Official Gazette on June 11, 2019

Alexandria Real Estate Equities, Inc.	)	
	)	
Opposer,	)	
	)	Opposition No. _____
v.	)	
	)	
Bugsby Property LLC	)	
	)	
Applicant.	)	
_____	)	

NOTICE OF OPPOSITION

Opposer Alexandria Real Estate Equities, Inc. ("Alexandria"), a Maryland corporation having its principal place of business at 26 North Euclid Avenue, Pasadena, California 91101, believes it will be damaged by registration of the trademark INCLUSIVE INNOVATION ("Applicant's Mark"), shown in application Serial No. 88/284,758, filed January 31, 2019, in International Class 45 (the "Application") and has a reasonable basis for this belief, and thus hereby opposes the same on the grounds that the mark is generic, or, in the alternative that it is descriptive of the services listed in the application.

As grounds for opposition, Alexandria alleges that:

1. Applicant is Bugsby Property LLC ("Applicant"), a Delaware limited liability company with an address of 1209 Orange Street, Wilmington, Delaware 19801.

2. Applicant seeks to register the INCLUSIVE INNOVATION trademark for intended use in connection with services related to a broad array of innovations relating to social

media, namely: "Online social networking services" in International Class 45 ("Applicant's Services").

3. Applicant's Mark was published in the Official Gazette of the United States Patent and Trademark Office ("PTO") on June 11, 2019 as application Serial No. 88/284,758.

4. Applicant's Mark, however, is simply the generic term "inclusive innovation" in standard type font and conveys no commercial impression apart from the plain meaning of the phrase "inclusive innovation."

5. The words that comprise the mark are generic terms. "Inclusive" is generally understood to mean something that includes a wide array of persons, items or services, and "innovation" is generally understood to mean the development of new ideas, methods or products. Applicant's Mark, "INCLUSIVE INNOVATION," thus has a plain meaning, namely, the development of new ideas, methods or products which are designed to include a wide array of persons, items or services.

6. A search of news items from recent years revealed several unrelated third parties using and continuing to use the phrase "inclusive innovation" to refer to services that cover a broad array of persons, items or services.

7. The Massachusetts Institute of Technology promotes an "Inclusive Innovation Challenge" to incentivize entrepreneurs to use "technology to create economic opportunity for works." Attached hereto as Exhibit 1 is a true and correct copy of the Inclusive Innovation Challenge website, available at https://www.mitinclusiveinnovation.com/.

8. The City of Pittsburgh has a website dedicated to "inclusive innovation" whose mission is to "includ[e] everyone in Pittsburgh's transformation." Attached hereto as Exhibit 2 is

a true and correct copy of the City of Pittsburgh's Inclusive Innovation PGH website, available at https://weinnovatepgh.net/.

9. The Aspen Institute lists many of its blog posts, publications and press releases under the general descriptive category of "inclusive innovation." Attached hereto as Exhibit 3 is a true and correct copy of The Aspen Institute's Inclusive Innovation webpage, available at https://www.aspeninstitute.org/tag/inclusive-innovation/.

10. The U.S. Department of Commerce's Minority Business Development Agency lists many of its blog posts, publications and press releases under the general descriptive category of "inclusive innovation." Attached hereto as Exhibit 4 is a true and correct copy of the Minority Business Development Agency's Inclusive Innovation webpage, available at https://www.mbda.gov/categories/inclusive-innovation.

11. The Office of the Deputy Mayor for Planning and Economic Development of the Washington D.C. government lists several initiatives relating to "inclusive innovation" on its website, including an "Inclusive Innovation Fund" to invest in and support DC businesses led by underrepresented entrepreneurs and an "Inclusive Innovation Incubator" space providing a physical space for offices, classes, workshops and events. Attached hereto as Exhibit 5 is a true and correct copy of the "inclusive innovation" website of the Office of the Deputy Mayor for Planning and Economic Development, available at https://dmped.dc.gov/page/inclusive-innovation.

12. Additionally, the concept of "inclusive innovation" has generally been the subject of study, both in the U.S. and abroad, for years.

13. For example, the organization Digital Promise published a study titled "Inclusive Innovation: Designing for Equity," on October 22, 2018. Attached hereto as Exhibit 6 is a true

and correct copy of the Digital Promise website detailing this study, available at https://digitalpromise.org/2018/10/22/inclusive-innovation-designing-equity/.

14. In July 2017, the Technology Innovation Management Review published an article titled "Inclusive Innovation in Developed Countries: The Who, What, Why, and How," by R. Sandra Schillo and Ryan M. Robinson, "summarize[ing] the origins of the concept of inclusive innovation." Attached hereto as Exhibit 7 is a true and correct copy of the Technology Innovation Management Review's website showing the article's abstract and the article, available at https://timreview.ca/article/1089.

15. In 2016, the U.S. National Library of Medicine of the National Institutes of Health ("NIH") published an article titled "Responsible, Inclusive Innovation and the Nano-Divide," by Doris Schroeder, Sally Dalton-Brown, Benjamin Schrempf and David Kaplan, which aims "to bridge the gap between innovation systems and RRI [Responsible Research and Innovation]." Attached hereto as Exhibit 8 is a true and correct copy of the NIH's webpage showing the article's abstract and the article, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4949307/.

16. In 2012, the Association for Information Systems ("AIS") published an article titled "Social Media in the Workplace: Key Drivers for Inclusive Innovation," by Chadi Aoun and Savanid Vatanasakdakul, analyzing the role that social media plays in organizations and was presented at the American Conference on Information Systems in Seattle, Washington on August 9-12, 2012. Attached hereto as Exhibit 9 is a true and correct copy of this AIS abstract and article, available at https://pdfs.semanticscholar.org/9aa2/e5a0c393ac6d140c2c23f1e9111e420742a5.pdf.

17. These examples show that the phrase "inclusive innovation" is a descriptor used to refer to innovation that includes a group of persons, entities or things.

18. As a result, the phrase "inclusive innovation" does not function as a trademark as defined by 15 U.S.C. § 1127 because it is simply a generic or, at best descriptive, phrase that refers to including persons or entities in the development of new methods, ideas or products, and thus cannot identify and distinguish any services of one entity from those offered by others.

19. In the alternative, if Applicant's Mark "INCLUSIVE INNOVATION" is not found to be generic, registration should be refused because "INCLUSIVE INNOVATION" is merely descriptive of Applicant's Services. As such, Applicant's Mark is not registrable under 15 U.S.C. § 1052(e).

20. The phrase "inclusive innovation" simply describes the development of new ideas, methods or products which are designed to include a wide array of persons, items or services.

21. Upon information and belief and assuming *arguendo* that acquired distinctiveness could be established in Applicant's Mark, Applicant has not acquired distinctiveness in the mark "INCLUSIVE INNOVATION."

22. Alexandria has a real interest in this case because it is an innovator in its field, and, as such, it has an interest in using the words "inclusive" and "innovation" (both individually and in combination) descriptively to promote services related to inclusivity and innovation, including, but not limited to, services that overlap with Applicant's services. Applicant must therefore not be permitted to attempt to monopolize the terms "inclusive" and "innovation," individually or in combination.

23. Alexandria is a leading publicly-traded real estate investment trust that provides, among other services, an array of real estate and business support and networking services to scientific, medical, and technology companies and institutions throughout the United States. Founded over two decades ago, Alexandria pioneered the market for dedicated scientific and

technology properties and collaborative business campuses designed to foster innovation, communication and exchange among its client tenants.

24. Alexandria uses concepts of innovation and inclusion to describe attributes of its business practices and the impact of its services, much of which results from its cluster business model. Attached hereto as Exhibit 10 is a true and correct copy of printouts from Alexandria's website showing Alexandria's use of the term "innovation" and its use of the concepts of innovation and inclusion, available at http://www.are.com/cluster-model.html, http://www.are.com/about.html, and http://www.are.com/careers.html.

25. In addition to its activities in the real estate market, Alexandria has taken a leading role in bringing together and facilitating collaboration, networking and discussion among individuals, companies, and institutions in the broad scientific, medical and technology research and development communities.

26. If Applicant is granted the registration herein opposed, Applicant would obtain at least a *prima facie* exclusive right to use the mark under 15 U.S.C. § 1115(a). Alexandria believes that such a registration will cause damage and injury to Alexandria as the right of Alexandria to refer to any inclusive innovation in the same industry may be improperly cast into doubt.

27. A registration resulting from the Application may become "incontestable" under the provisions of 15 U.S.C. § 1065, which would further improperly cast into doubt Alexandria's right to use the term inclusive innovation.

28. Registration of Applicant's Mark on the USPTO Principal Register is also likely to cause Applicant to try to exclude others, including Alexandria, from using the words "inclusive" and "innovation," either together or in any combination that Applicant deems to be confusingly similar to Applicant's Mark.

29. This likelihood is particularly of concern to Alexandria given that Alexandria is a direct competitor of Applicant in housing, managing and fostering start-up businesses. If Applicant is able to register the generic (or descriptive) phrase "inclusive innovation," Applicant could use the registration against Alexandria—its direct competitor—to try to prevent Alexandria from using the generic terms "inclusive" and "innovation."

30. Alexandria has a reasonable basis for its concerns, which are heightened by the fact that the parties and their affiliates are engaged in other business dispute and litigation matters.

WHEREFORE, based on the foregoing, Alexandria believes that it will be damaged by the registration of Applicant's Mark and requests that the Board sustain this Opposition and that registration of Application Serial No. 88/284,758 be refused.

Dated: October 9, 2019

Respectfully submitted,

By: /hsh/

Howard S. Hogan
Claudia M. Barrett
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pto-oc@gibsondunn.com

Attorneys for Opposer
Alexandria Real Estate Equities, Inc.

EXHIBIT 1

MIT INCLUSIVE INNOVATION CHALLENGE

Tech for Opportunity

MIT awards $1.6 million to organizations revolutionizing the future of work.

Global Events

Africa

September 20, 2019

IIC Africa Celebration

Liquid Telecom hosted the IIC Africa Celebration in Addis Ababa, Ethiopia on September 20.

Asia

Europe

Latin America

US & Canada

Global

Regional Winners

Africa	Asia	Europe	Latin America	US & Canada
Taskty	NaTakallam (we•speak)	Padlock	TiendaPago	JobGet
Social Lender	Youth4Jobs	beam	Talentu	skillist
shopit	asia initiatives	Organise	AGROS	aira
Tiny Totos KENYA	INNOVISION	Reaktor	JETTY	Center for Family Life in Sunset Park, SCO Family of Services

Regional Finalists

Congratulations to our Finalists!

Africa

Financial Inclusion

Bloom Impact

inclusivity solutions

Income Growth & Job Creation

KUMWE HARVEST

INDLU

Skills Development & Opportunity Matching

فرصنا.كوم
فرص شغل بجد

Shortlist

Technology Access

flare EMERGENCY RESPONSE

Farmerline

Asia

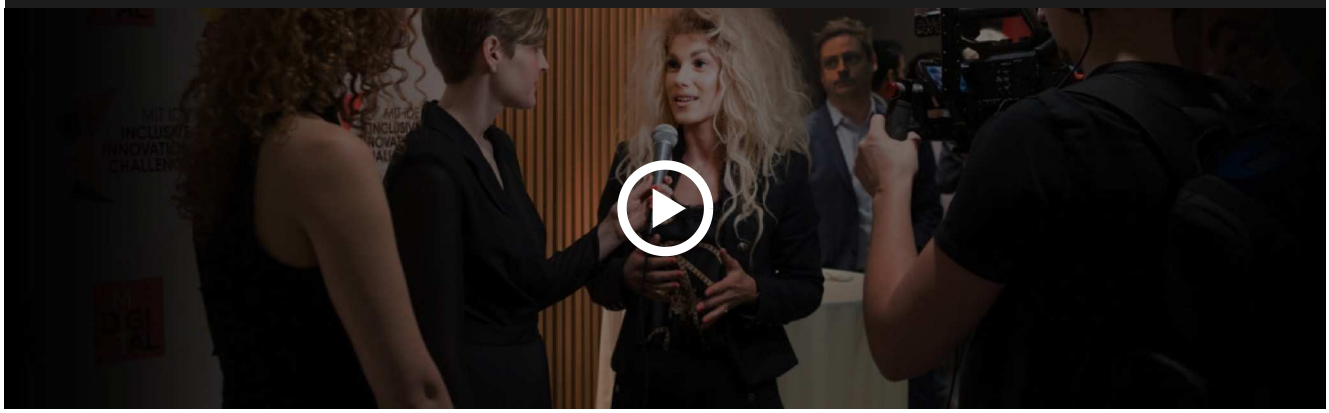
Europe

Latin America

US & Canada

Put your solution in the MIT spotlight

(and win $250,000 to scale your organization)



A Global Tournament

The IIC is MIT's premier future of work prize, awarding $1.6 million annually to entrepreneurs using technology to create economic opportunity for workers. We collaborate with like-minded organizations in five regions to select and celebrate sixty Regional Finalists from across the globe. Twenty Regional Winners proceed to MIT where four Global Grand Prize Winners each win $250,000 and world-wide recognition.

The Challenge

US & Canada Latin America Europe Africa Asia

Registration & Application Period

Registration Opens
March 7, 2019

Registration Closes
May 9, 2019

Application Closes
May 23, 2019

Judging

Administrative Review
May 24-June 4, 2019

Judge Evaluation
June 5-July 10, 2019

Announcements & Regional Events

Regional Finalists Announced
July 23, 2019

Regional Celebrations
September-October 2019

Global Grand Prize Gala

Global Grand Prize Winners Announced
November 21, 2019

Since the IIC launched in 2016

3,000

organizations have registered

From more than

100 Nations

With the help of

100+ Global Outreach Partners

500 Judges

3,300 Event Attendees

The IIC has celebrated

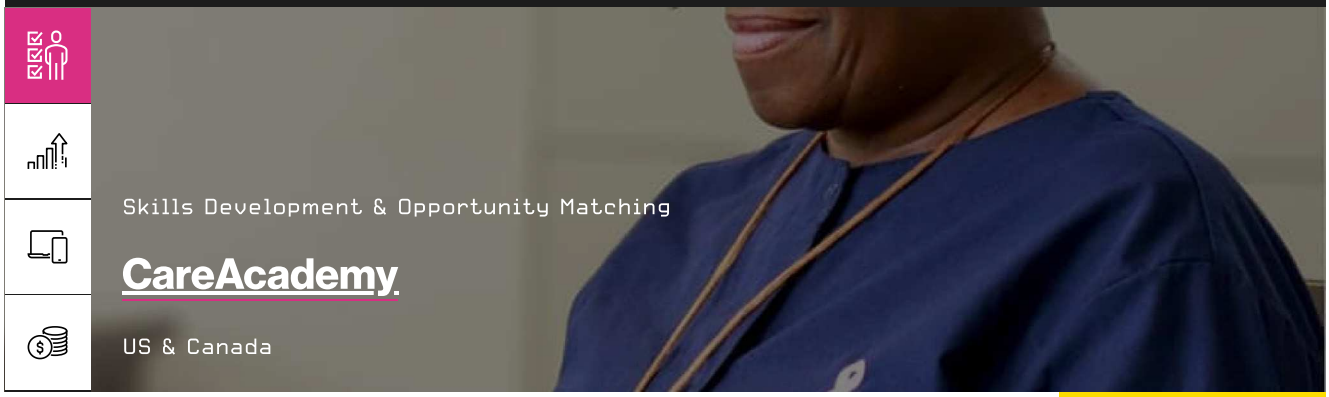
100 Winners

Awarding

$3.5m

for tech for good

2018 Grand Prize Winners



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Press

AFRIKATech

BBC future

Bloomberg

The Boston Globe

Boston MAGAZINE

CNN

CRAIN'S DETROIT BUSINESS

EXAME

Forbes

Harvard Business Review

信報 HONG KONG ECONOMIC JOURNAL

HUB week

THE HUFFINGTON POST

MIT News ON CAMPUS AND AROUND THE WORLD

MIT MANAGEMENT SLOAN SCHOOL

NEW AMERICA

PEQUENAS GRANDES Empresas & Negócios

pulse

SIMI Sistema Mineiro de Inovação

TECH IN AFRICA

THOMSON REUTERS

WSJ

The Washington Post

WORLD ECONOMIC FORUM

Ventureburn STARTUP NEWS FOR EMERGING MARKETS

Xconomy

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MIT

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EXHIBIT 2

INCLUSIVE INNOVATION PGH

Including Everyone in Pittsburgh's Transformation

Inclusive innovation is an action. It is providing equal access to products and services through the infusion of new ideas, people, and technology to meet complex challenges. From the arts to community development, to computer science; inclusive innovation is possible in everything. We know there is a tremendous opportunity when diverse people come together to problem solve. We strive for everyone to participate in and benefit from the development of new solutions. We believe in a Pittsburgh where

▶ if it's not for all it's not for us!

William Peduto

Mayor, City of Pittsburgh

What We Do

Community Engagement

Convene partners and organizations to identify strategies to move Pittsburgh collectively forward.

Learn About our Meetup Group

Digital Storytelling

Communicate and raise awareness for organizations propelling inclusive innovation forward.

Read About our Work

Program Development

Lead and support new initiatives identified as priorities through the Roadmap for Inclusive Innovation.

Initiatives That We lead

Strategic Planning

Measure outcomes and impacts of projects under the purview of the Roadmap for Inclusive Innovation.

Roadmap Focus Areas

Featured News

Headlines

Want Pittsburgh to be more inclusive? Take this 5-part challenge. via NEXTPittsburgh 04/01/19

Takeaways from the 2019 Inclusive Innovation Summit via Medium 04/05/19

"Innovation Summit" to highlight inclusion, equity in Pittsburgh via Pittsburgh Post-Gazette 03/11/19

INCLUSIVE INNOVATION PGH

ura Urban Redevelopment Authority of Pittsburgh

Inclusive Innovation is a joint collaboration between the City of Pittsburgh, the Department of Innovation & Performance and The Urban Redevelopment Authority. Special thanks to the Richard King Mellon Foundation and the Hillman Family Foundations for their generous support to Inclusive Innovation.

FOCUS AREAS

City Operations

Civic Engagement

SOCIAL MEDIA

Meetups

Medium

Clean Technology

Digital Divide

Local Business

Open Data

Twitter

EXHIBIT 3

Inclusive Innovation

FAMILY FINANCES

A National Financial Inclusion Strategy

May 2019 Aspen FSP held a private convening on pursing a national financial inclusion strategy.

BY **FINANCIAL SECURITY PROGRAM**

OF INTEREST 07.24.2019

FAMILY FINANCES

Financial Inclusion and Impact

July 18, 2019 Genevieve Melford to present at the Financial Inclusion and Impact: Updating the Narrative Roundtable, hoste...

BY **FINANCIAL SECURITY PROGRAM**

OF INTEREST 07.08.2019

FAMILY FINANCES

CRA in the Digital Era

How can we make sure rapidly changing financial institutions don't leave low- and moderate-income Americans behind?

BY ARJUN KAUSHAL, **& 1 MORE**

BLOG POST 01.15.2019

FAMILY FINANCES

Fulfilling the Promise of Fintech

Fintech has the potential to improve the lives of Americans who are struggling financially.

BY BUSINESS OWNERSHIP INITIATIVE & 1 MORE

BLOG POST 09.13.2018

FAMILY FINANCES

The nLIFT Manifesto

This Manifesto sets forth nLIFT's vision, our values, and our theory of change within the fintech sector.

BY FINANCIAL SECURITY PROGRAM & 2 MORE

PUBLICATION 09.11.2018

URBAN INNOVATION

A More Inclusive Approach to Venture Capital: Action Steps

A More Inclusive Approach to Venture Capital: Action Steps for Venture Capitalists, Ecosystem Builders, and Philanthropies is ...

BY CENTER FOR URBAN INNOVATION

PUBLICATION 07.10.2018

URBAN INNOVATION

Access to Capital for Urban Innovators

Urban innovators share a commitment to using new approaches, and often new technologies, to tackle long-standing...

BY CENTER FOR URBAN INNOVATION

PUBLICATION 06.22.2018

URBAN INNOVATION

'People Need To Feel That Their Feedback Has Been

This interview with Karin Brandt, Chief Executive Officer and Co-Founder, coUrbanize, is the twenty-second and fina...

BY KARIN BRANDT

BLOG POST 04.26.2018

URBAN INNOVATION

'It Would Be Amazing If Residents Met the People Who

This interview with Nick DeMonner and Maggie Henry of Seneca Systems is the twenty-first in the Center for Urban...

BY NICK DEMONNER & 1 MORE

BLOG POST 04.24.2018

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EXHIBIT 4

Inclusive Innovation

PRESS RELEASES
New DoD SBIR Opportunities!

WED, 12/19/2018 - 9:46PM
AI and Automation — Preparing America's Next Frontier

WED, 12/19/2018 - 9:46PM
SXSW Interactive Festival

WED, 12/19/2018 - 9:45PM
Money20/20 USA: Where Money Revolutionaries Unite

WED, 12/19/2018 - 9:45PM
Adobe 99U Conference: The Creative Future

DEC 04, 2018
PRESS RELEASES
Wealth Building Process of Tech Transfer Revealed and Supported Within Minority Communities

PUBLISHED ON: /NOV 20,
MBDA InVision Tour

GROW YOUR BUSINESS BLOG
Request for Information Regarding Federal Technology Transfer Authorities and Processes

GROW YOUR BUSINESS BLOG
Re-defining Innovation: MBDA Attends The 2018 Federal Laboratory Consortium Meeting

GROW YOUR BUSINESS BLOG
Mapping Out More Tech Transfers at Brain and Therapeutics Conference (Part II)

MINORITY BUSINESS DEVELOPMENT AGENCY
U.S. DEPARTMENT OF COMMERCE

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- Digital strategy
- No Fear Act
- Privacy Policy
- USA.gov
- Inspector General
- Agency Financial Report
- EEO Policy
- GobiernoUSA.gov
- Comment Policy
- Information quality
- Plain language
- Whistleblower Protection
- Whitehouse.gov

Inclusive Innovation

GROW YOUR BUSINESS BLOG
MBDA Backs Up the Bus For Small Business Innovation Research

GROW YOUR BUSINESS BLOG
Mapping Out More Tech Transfers at Brain And Therapeutics Conference

GROW YOUR BUSINESS BLOG
National SBIR Road Tour to Engage Innovative Entrepreneurs

THU, 03/08/2018 - 3:14PM
Women's Entrepreneurship Symposium

GROW YOUR BUSINESS BLOG
National Data Privacy Day, January 28th

GROW YOUR BUSINESS BLOG
Nominations Sought for National Medal of Technology and Innovation 2018

GROW YOUR BUSINESS BLOG
Creating the Conditions for Minority Women Entrepreneurs to Succeed

GROW YOUR BUSINESS BLOG
MBDA Joins SBIR Road Tour in September

GROW YOUR BUSINESS BLOG
In Case You Missed It | Exclusive Tips Taking MBEs to Greater Success

GROW YOUR BUSINESS BLOG
Don't Miss Out: NSF Still Accepting Proposals for Innovative Funding Opportunity

Inclusive Innovation

GROW YOUR BUSINESS BLOG
Go ahead. Rock the boat.

GROW YOUR BUSINESS BLOG
Three Steps to Access SBIR Grants

GROW YOUR BUSINESS BLOG
MBDA Participates in the First Ever "Inclusive Innovation House" at SXSW

PUBLISHED ON: /DEC 14,

Inclusive Innovation Initiative

GROW YOUR BUSINESS BLOG
Rutgers CUEED Pipeline to Inclusive Innovation Boot Camp Application

GROW YOUR BUSINESS BLOG
SBA Expands its Emerging Leaders Initiative Helping Small Businesses to Thrive

GROW YOUR BUSINESS BLOG
Nominations Sought for National Medal of Technology and Innovation

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Celebrating small business during National Consumer Protection Week

GROW YOUR BUSINESS BLOG
Feb. 11 is National Inventor's Day: Eight Steps to Secure Your Patent

GROW YOUR BUSINESS BLOG
Atlanta Leads the Way with Regional Innovation Ecosystems

Inclusive Innovation

GROW YOUR BUSINESS BLOG
SBA Launches 2017 InnovateHER Business Challenge for Innovations That Empower Women's Lives

GROW YOUR BUSINESS BLOG
Innovation Can Help Narrow the Wealth Gap: MBEs Own Just as Many Patents as Nonminority-Owned Firms

GROW YOUR BUSINESS BLOG
Why the future success of our economy depends on the expansion of U.S. minority-owned business

GROW YOUR BUSINESS BLOG
MBDA's Inclusive Innovation in Action Event Draws Chicago's Tech Community During MED Week

GROW YOUR BUSINESS BLOG
MBDA Sparking Innovation through New Outreach Initiative

GROW YOUR BUSINESS BLOG
Where's the money? Getting funding from the SBA

AUG 17, 2016
NEWS AND ANNOUNCEMENTS
How to Work with the Lab?

AUG 17, 2016
NEWS AND ANNOUNCEMENTS
Federal Laboratory Consortium Education Resources

AUG 17, 2016
NEWS AND ANNOUNCEMENTS
Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR)

AUG 17, 2016
NEWS AND ANNOUNCEMENTS
Regional Ecosystem Partners

Inclusive Innovation

AUG 17, 2016

NEWS AND ANNOUNCEMENTS

Federal Lab Spotlight

AUG 17, 2016

NEWS AND ANNOUNCEMENTS

Inclusive Innovation Initiative Mission

GROW YOUR BUSINESS BLOG

Minority Entrepreneurs and the Innovation Ecosystem

GROW YOUR BUSINESS BLOG

SBA Introduces Online Tutorials for Small Businesses Seeking Federal R&D Funding

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America's Seed Fund

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Keeping International Competition Front of Mind

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ACE Tool: New Data Aids US Business Investment Decisions

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Exploring the Landscape of American Innovation (CDS & USPTO)

GROW YOUR BUSINESS BLOG

The Inaugural AAPI Business Summit: Inclusive Innovation Drives Economic Growth

GROW YOUR BUSINESS BLOG

Fostering Diversity and Inclusion in an Innovation Economy

Inclusive Innovation

GROW YOUR BUSINESS BLOG
The Case for Inclusive Innovation: Minority Entrepreneurship and America's Economic Future

GROW YOUR BUSINESS BLOG
MBDA Participates in the Department of Commerce's DOC Talks

GROW YOUR BUSINESS BLOG
MBDA Showcases the Importance of Inclusive Innovation at the 2016 Federal Laboratory Consortium (FLC) Conference

GROW YOUR BUSINESS BLOG
EDA to Hold Series of Webinars for Potential 2016 Regional Innovation Strategies Program Applicants

GROW YOUR BUSINESS BLOG
From Discovery to Commercialization: Join MBDA at the 2016 Federal Laboratory Consortium National Meeting!

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SBA Promotes STEM based Innovation with National 2016 SBIR Road Tour

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MBDA and PowerMoves Miami Support Minority Entrepreneurs in Tech

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The Next Generation of Youth Entrepreneurs in STEM Innovation

GROW YOUR BUSINESS BLOG
A Call to Action: Supporting the Next Generation of Innovators and Entrepreneurs

GROW YOUR BUSINESS BLOG
Mentoring: A Proven Tool For Building A More Dynamic and Diverse Workforce

Inclusive Innovation

GROW YOUR BUSINESS BLOG
Calling all Women-Owned Small Businesses...

GROW YOUR BUSINESS BLOG
Innovation & Entrepreneurship Exchange in Arizona & California

GROW YOUR BUSINESS BLOG
Who's first? Patent and Trademark Searching for Business Owners

GROW YOUR BUSINESS BLOG
Inclusive Innovation Spotlight: Maxine Paul, CEO/CTO and Co-Founder of Pitch Love

GROW YOUR BUSINESS BLOG
Inclusive Innovation Spotlight: Lauren Rosario, Innovation Analyst at CodeMyMobile

GROW YOUR BUSINESS BLOG
Inclusive Innovation Spotlight: Rod Robinson, Founder and CEO of ConnXus, Inc.

GROW YOUR BUSINESS BLOG
MBDA at White House Demo Day

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Inclusive Innovation Spotlight: Nicole Tucker Smith, Co-Founder LessonCast Learning

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Inclusive Innovation Spotlight: Natalie Madeira Cofield, Founder and CEO of Urban Co-lab

GROW YOUR BUSINESS BLOG
The Power of Inclusive Innovation

Inclusive Innovation

GROW YOUR BUSINESS BLOG
Grand Slam Day for America's High-Growth Entrepreneurial Ecosystem and Its Startups

GROW YOUR BUSINESS BLOG
Fueling High-Tech Growth through Minority Businesses

GROW YOUR BUSINESS BLOG
SBA Launches Second Round of InnovateHER

GROW YOUR BUSINESS BLOG
Innovation: Much More than High-Tech

GROW YOUR BUSINESS BLOG
Advocacy Research Examines How Patenting Changes May Affect Small Innovators

GROW YOUR BUSINESS BLOG
America's Largest Seed Fund is Coming to a City Near You

GROW YOUR BUSINESS BLOG
SBIR Pulse – 2015 National Conference Special Edition – STE(A)M Innovation Pipelines Session

GROW YOUR BUSINESS BLOG
America's Seed Fund Logo Design Competition (SBIR/STTR) – Calling all Artists, Designers and Creatives Across The Country

GROW YOUR BUSINESS BLOG
Free USPTO/MBDA Webinars: Going Global with Intellectual Property

GROW YOUR BUSINESS BLOG
VIDEO: The Innovative and Useful U.S. Cluster Mapping Tool

« first ‹ previous ... 3 4 5 6 7 **8** 9 10 11 next › last »

Inclusive Innovation

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Register Today! 2015 Spring National SBIR/STTR Conference in Washington, DC (June 15-17)

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America's Largest Seed Fund is Coming to a City Near You

GROW YOUR BUSINESS BLOG
Increasing Mentor-Protégé Opportunities for all Small Businesses

GROW YOUR BUSINESS BLOG
National Road Tour Promotes Innovation and Technology

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Northern California MBDA Business Centers Help Minority Entrepreneurs Enter Technology Transfer, Innovation Market

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EXHIBIT 5

Office of the Deputy Mayor for Planning and Economic Development

Office of the Deputy Mayor for Planning and Economic Development - DMPED

Office Hours
Monday to Friday, 8:30 am to 5:30 pm

Connect With Us
John A. Wilson Building
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Fax: (202) 727-6703
TTY: 711
Email: dmped.eom@dc.gov

Ask the Director
Agency Performance

Inclusive Innovation

The District of Columbia approaches technological innovation and economic growth with a focus on the participation of historically unrepresented communities. The Business Development team is committed to making Washington, DC the capital of inclusive innovation. Below are a few resources, events and tools provided to help reach that goal:

Innovation & Technology Inclusion Council
The Innovation & Technology Inclusion Council (ITIC) advises the Mayor and the public on ways in which to grow the District's innovation and tech-economy in an inclusive manner, increase the number of jobs and high-technology businesses in the District, and ensure opportunities for all District residents.

Pathways to Inclusion Report

The 'Pathways to Inclusion Report' was cultivated from a commitment by Mayor Muriel Bowser and the ITIC to expand the District's innovation economy in a way that will serve as a national model for inclusion and diversity.

Inclusive Innovation Fund

The Inclusive Innovation Fund is a District-supported, privately-managed fund that will invest in and support early stage District businesses led by underrepresented entrepreneurs.

Inclusive Innovation Incubator

In3 is the District of Columbia's first community space focused on inclusion, innovation and incubation. The incubator is committed to creating a collaborative environment where under-resourced members have access to the space and services needed to build or grow a successful business.

WeDC House at SXSW

Each year, DMPED's business development team, along with the Washington DC Economic Partnership attend the South by Southwest Conference to promote Washington, DC as the Capital of Inclusive Innovation. During the three-day event, the team activates the #WeDC house and showcases DC-centric programming, activations, and events that create new business connections including technology, innovation and creative economies.

DMPED Real Estate Project Pipeline

The DMPED Real Estate Project Pipeline provides our stakeholders with real time updates on the status of real estate projects located across the District of Columbia.

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EXHIBIT 6

Inclusive Innovation: Designing for Equity

October 22, 2018 | By Kim Smith

The word "equity" inspires good feelings. Who doesn't want all students to access and participate in powerful learning opportunities? The challenge is equity efforts in public education often fall short of their intentions.

The world is inequitable by design—therefore, so is our education ecosystem. To quote Caroline Hill, founder of 228 Accelerator and co-author of the EquityXDesign framework, "Racism and inequity are products of design—and they can be redesigned." **The disadvantages that low-income students and students of color face are known and can be addressed.** With an intentional focus on students at the margins, it is possible to create equitable access, participation, and outcomes.

It is particularly interesting to examine why the ubiquity of innovation and technology has not managed to level the playing field. Thirty years after the World Wide Web provided a gateway for the world to access information, connect, and learn, we are still facing a digital divide that has contributed to a continually expanding digital learning gap. Why hasn't innovation in teaching and learning cascaded to underserved populations? What are the systems, structures, and cultures that are barriers to creating and implementing powerful learning opportunities for all?

At Digital Promise our mission is to accelerate innovation in education to improve opportunities to learn with the goal of closing the Digital Learning Gap. We have launched an effort to critically examine our work organizationally and within the League of Innovative Schools to target the barriers to participation in the education innovation ecosystem, with the goal of creating and catalyzing equitable opportunities for underrepresented individuals and groups to lead, participate in, and benefit from innovation.

The focus of our effort—***Inclusive Innovation***—is supported by research summarized in the report, Making

The focus of our effort—*inclusive innovation*—is supported by research summarized in the report, Making Innovation Benefit All: Policies for Inclusive Growth from Organization for Economic Cooperation and Development (OECD). The report examines how inclusive innovation policies can compliment "education policies aimed at ensuring equal access to high-quality education (from early childhood to tertiary education) and promoting high educational attainment by all segments of society." This report defines inclusive innovation policies and practices that aim to "remove barriers to the participation of individuals, social groups, firms, sectors, and regions underrepresented in innovation activities."

Our work is purposeful in broadening three dimensions of innovation towards inclusivity:

- **The Definition of Innovation**: Expanding the criteria for identifying and describing innovation beyond technology, form and function
- **The Creators of Innovation**: Expanding who is an innovator beyond academic achievement, professional attainment and leadership or authority
- **The Participants in Innovation**: Expanding access to innovation beyond the user who traditionally has direct, unrestricted access

As school leaders whose districts reach close to three million students, with 50 percent or more including students of color and students who qualify for free-and-reduced lunch rate as well as 28 percent in rural areas, equity is a high priority challenge (see the Challenge Map). Through our **Inclusive Innovation** initiative, Digital Promise and the League are committed to critically examine our own work and double-down on purposeful design to advance equitable opportunities and outcomes for students.

You can keep updated on our research, the progress of our work, and the stories we are cataloging by following #DPLIS.

Category: Blog | Educators | League of Innovative Schools

Share this

Author: Kim Smith is the Executive Director of the League of Innovative Schools. You can follow her on Twitter at @k12kimsmith.

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By Kristen Franklin

EXHIBIT 7

Technology Innovation Management Review

Inclusive Innovation in Developed Countries: The Who, What, Why, and How

R. Sandra Schillo, Ryan M. Robinson

July 2017

> *There's something cooking and the lights are low.*
> *Somebody's trying to save our mother earth.*
> *I'm gonna help them to save it,*
> *To sing it and bring it,*
> *Singing: No no Keshagesh [greedy guts]*
> *You can't do that no more, no more, no more, no more...*
>
> Buffy Sainte-Marie
> Canadian singer-songwriter, visual artist, and social activist
> In "No No Keshagesh"

Abstract

Although widely appreciated as an important driver of economic growth, innovation has also been established as a contributor to increasing economic and social inequalities. Such negative consequences are particularly obvious in the context of developing countries and extreme poverty, where innovation's contributions to inequalities are considered an issue of social and economic exclusion. In response, the concept of inclusive innovation has been developed to provide frameworks and action guidelines to measure and reduce the inequality-increasing effects of innovation. In developing countries, attention has only recently turned to the role of innovation in increasing inequalities, for example in the context of the degradation of employment in the transition from production to service industries. Although the focus of this early work is primarily on economic growth, innovation in developed countries also contributes to social exclusion, both of groups traditionally subject to social exclusion and new groups marginalized through arising innovations. This article summarizes the origins of the concept of inclusive innovation and proposes a four-dimensional framework for inclusive innovation in developed countries. Specifically, innovation needs to be inclusive in terms of people, activities, outcomes, and governance: i) individuals and groups participating in the innovation process at all levels; ii) the types of innovation activities considered; iii) the consideration of all positive and negative outcomes of innovation (including economic, social, and environmental); and iv) the governance of innovation systems. This framework is intended to guide policy development for inclusive innovation, as well as to encourage academics to investigate all dimensions of inclusive innovation in developed countries.

Introduction

Innovation, traditionally defined as the development of new goods, services, or processes, has long been an important driver of positive outcomes such as economic growth and societal well-being. However, a range of longer-term trends combined with the recent financial crisis and slow recovery have made it obvious that innovation also plays an important role in creating negative outcomes, such as income inequalities (Aghion et al., 2015). In many developing countries, overall economic growth is no longer associated with socio-economic improvements for the poorest (Chataway et al., 2014). In developed countries, inequalities have increased to a level where they are socially and economically damaging (Stiglitz, 2012), giving rise to criticism of scientists and innovators as "remote elitists" (Long & Blok, 2017).

Notionally, inclusive innovation has the potential to be a socially responsible endeavour (Fisher, 2017) – a means to address social and economic exclusion. This article discusses the concept of inclusive innovation and provides a framework of four key dimensions to consider in its implementation. The discussion of the framework's four dimensions – people, activities, outcomes, and governance – highlights that superficial implementation of inclusiveness concepts is unlikely to

Funding

The TIM Review received partial funding from FedDev Ontario's Investing in Regional Diversification initiative.

Canada

In this issue

About this article

Citation:

Schillo, R. S., & Robinson, R. M. 2017. Inclusive Innovation in Developed Countries: The Who, What, Why, and How. *Technology Innovation Management Review*, 7(7): 34-46. http://doi.org/10.22215/timreview/1089

Cite this article:

BibTex RTF Tagged MARC XML RIS

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More by this author

Ryan M. Robinson
University of Ottawa

Ryan M. Robinson is a Third Year Undergraduate student attending the University of Ottawa's Telfer School of Business Management in Ottawa, Canada. He was born and raised in Oshawa, Canada: a city with its history carved out by advances in technological innovation. Today, Ryan balances living in these two very different locales, both of which are writing the story of diversity and inclusion in Canada. Being continuously surrounded by innovative landscapes, Ryan plans continue to study the evolution of innovation in Canada following the completion of his degree in Finance.

More by this author

lead to the achievement of economic, social, and environmental goals. Rather, true inclusiveness with economic, social, and environmental benefits will require a broader definition of innovation; structural and post-structural changes within the innovation landscape; reflexive and evolutionary policy design; and ample societal space for experimentation and exploration of different innovation narratives.

Theoretical Precursors to Inclusive Innovation

There is now broad consensus that innovation does not only serve economic growth and competitiveness, but that governments invest in innovation with a broad range of further objectives (Bozeman & Sarewitz, 2011; Lindner et al., 2016; Mazzucato & Semieniuk, 2017; Miller & Neff, 2013; Schillo & Kinder, 2017). This increased awareness of non-economic objectives is often framed in the context of "grand challenges" (Hicks, 2013; Kallerud et al., 2013) and has been applied extensively in policy development in Europe, the United States, and many other countries.

The arising expectations of innovation are immensely broad. At a high level, policy developers and citizens look to innovation to contribute to the solution of society's "grand challenges" (Kallerud et al., 2013), but there are also specific issues to which innovation is expected to make contributions, such as the introduction of low-carbon technologies (Andersen & Johnson, 2015), agriculture and development (Joseph, 2014), and education. The emphasis on these expectations has increased substantially over the past 15 years (Hicks, 2016; Lindner et al., 2016), and researchers have suggested that it may lead to a new social contract of science and innovation (Owen et al., 2013) and may fundamentally transform both science and policy making (Kuhlmann & Rip, 2014).

This broad societal and policy interest in the potential of innovation to contribute to society has been paralleled by several developments in the academic literature:

Public value mapping (Bozeman & Sarewitz, 2011) is based on the theory of public value failure (Bozeman, 2002). This theory is a response to the prevalence of market failure motivations in public policy in general, and in science and innovation policy in particular. It is based on the assertion that governments should work in the public interest, and that market failure rationales do not provide sufficient motivation to address public values. An extensive body of literature has further developed this theory and approach, which has found broad resonance in the science policy community, and has recently also been brought into the discussion on responsible innovation (von Schomberg, 2014).

The quintuple helix (Carayannis & Campbell, 2010; Carayannis et al., 2012) theory is similar in that it seeks to highlight considerations of societal importance, but it focuses specifically on the contributions of innovation to global warming and related environmental concerns. It builds on quadruple helix theory, which already integrates innovation into its social context, and sees "government, academia, industry, and civil society […] as key actors promoting a democratic approach to innovation through which strategy development and decision-making are exposed to feedback from key stakeholders, resulting in socially accountable policies and practices" (Carayannis & Campbell, 2012). As such, quintuple and n-tuple theory (Leydesdorff, 2012) integrate innovation within its societal and natural environments, and they highlight inclusiveness dimensions such as democratization of innovation and relevance to economic development (Carayannis & Campbell, 2012).

Innovation for development and innovation for sustainable development emphasize society and the physical environment respectively. With regards to economic development, the potential of science and innovation to benefit developing countries has long been recognized, with policy programs in place since the 1950s and 60s (Brook et al., 2013) and an extensive literature on technology transfer from developed to developing countries (Reddy & Zhao, 1990). Over time, such policies were viewed more critically. A key criticism relates to the conceptualization of developing countries simply as "recipients" of technology, and the related implementation of programs that limited local engagement to the application of existing technologies, rather than meaningful engagement in the innovation process. As a result, policies began to focus more on building scientific and technological capacity and infrastructure (Brook et al., 2013).

More recently, however, and in parallel to the consideration of grand challenges in the innovation context, an emerging literature has renewed its focus on innovation for development – as compared to science and technology capacity and infrastructure. This emerging perspective considers innovation occurring in developing countries – using terms such as "frugal innovation" (Lehner & Gausemeier, 2016; Zeschky et al., 2011), "reverse innovation" (Chataway et al., 2014),

"Jugaad innovation", "bottom of the pyramid (BOP) innovation" (Hall et al., 2012; Prahalad, 2005), "Gandhian innovation", "empathetic innovation" and "pro-poor vs. from-the-poor", "long-tail and long-tailoring innovation", "below-the-radar innovation" – and explicitly acknowledges social contexts characterized by resource constraints and insecurities (Pansera & Martinez, 2017).

Innovation for sustainable development emerged as a literature stream in the 1990s in parallel to the increasing awareness of environmental damages and sustainability (Martin, 2016). From early publications onwards (Freeman, 1996; Kemp & Soete, 1992; Rennings, 2000), this literature did not simply focus on product innovation leading to reduced environmental impacts, but rather considered the systemic implications of designing innovation for sustainability. This concern later found an expression in the literature on sustainability transitions (Geels, 2010) – a topic addressed by several researches who also are making key contributions to the inclusive innovation literature, such as Rip (e.g., Kuhlmann & Rip, 2014) and Schot (e.g., Schot & Steinmueller, 2016).

Technology assessment has its origin in the requirement of developing "an earlier awareness, an earlier warning, and an earlier understanding of what might be the social, economic, political, ethical and other consequences of the introduction of a new technology into the society or a substantial expansion of an existing technology" (Tran & Daim, 2008), in particular for policy purposes in the United States. This stream of work was initiated in the late 1960s, and a range of tools was developed with varying foci, all of which involved foresight and a priori assessments. One particularly important stream of this research was developed in the context of health research to assess the potential health impacts of new technologies a priori. Another widely applied stream of research resulted in various forms of lifecycle assessments for environmental impacts. Initially, the consideration of stakeholders in technology assessment was limited to experts assessing the impact on various stakeholder groups (van Lente et al., 2017), but more recent methods of technology assessment emphasize the importance of including stakeholders in the assessment of technologies (participatory technology assessment: Sclove, 1995, 2012; Joss & Bellucci (2002), and also in the creation of technologies themselves (constructive technology assessment: Schot & Rip (1997).

Appropriate technologies is another concept that emphasizes the impacts of technologies. Building on the seminal work "Small is Beautiful" by Schumacher (1973), a flourishing community of practice and academic literature developed, focusing first on inventing more inclusive technologies, and then on implementing them. Pointing out that global research and development was highly concentrated in high-income economies, the appropriate technologies movement highlighted how the resulting technologies inadequately met the needs of the poor (Chataway et al., 2014). Although well-intentioned, the resulting technologies did not find broad uptake (Kaplinsky, 2011), and the appropriate technologies movement is generally considered a failure (Papaioannou, 2014), although its ideas have had a strong influence on many of the trends and streams of literature discussed here.

Responsible research and innovation (RRI) has emerged in the context of policy pressures on research and innovation to address societal concerns (Strand et al., 2015; van Lente et al., 2017; von Schomberg, 2012, also note the link with technology assessment: Delvenne, 2017; van Est, 2017; van Lente et al., 2017). RRI "is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products(in order to allow a proper embedding of scientific and technological advances in our society)" (von Schomberg, 2012).

The discourse on responsible innovation emerged particularly in the context of developments in nanoscience and nanotechnology research, and from an intent to consider societal implications and stakeholder interests early on. At that time, the difficulties surrounding genetically modified organisms were still recent and evolving, and the development of responsible innovation concepts aimed to ensure consideration of downstream effects early on in the process (Owen et al., 2013).

The inclusion of broad groups of stakeholders and potential consequences is central to RRI (Martin, 2013; Owen et al., 2012), and one framework explicitly contains "inclusion" as a dimension of RRI (Stilgoe et al., 2013). This work will be discussed in more detail in the following section.

In addition, *broader trends in the innovation literature* have recently challenged existing paradigms of innovation and have had far-reaching influence not only on how innovation is perceived. Open source software (von Hippel & von Krogh, 2003), open innovation (Chesbrough, 2003), and open science (Partha & David, 1994) hold the potential of increased collaboration and inclusiveness. However, experience shows that sustained societal benefits can only be achieved under all three

paradigms if intellectual property is managed carefully, and successful collaborator communities have developed sophisticated standards and practices to systematically protect and reveal specific aspects of science and technologies. Especially the open source and open science movements often feature ambitions of increased inclusiveness both in the creation of innovation and in expanding access to innovation, but efforts to include socially diverse groups tend to require substantial efforts and are not very common to date.

User innovation, the democratization of innovation (von Hippel, 2005), and grassroots innovation (Fressoli et al., 2014; Smith et al., 2014) highlight the role of users as active participants in the innovation process. To round out this review, social innovation (Benneworth et al., 2014; Cajaiba-Santana, 2014) and entrepreneurship (Austin et al., 2006) emphasize the achievement of social outcomes and the integration of excluded groups within the innovation process, and "social innovation is specifically focused on the change of norms, regulations and cognitive frames with a view to improved social practices" (Ziegler, 2015).

Inclusive Innovation

The above description of relevant fields of research suggests that researchers approach the topic of inclusivity from a range of perspectives. In particular, inclusivity in terms of considering consequences of innovation is an important theme, and it emphasizes that innovation does not only lead to economic outcomes, but also to social and environmental outcomes. Within this general context of increased awareness of the social and environmental context of innovation, there are several developments that focus specifically on inclusive innovation or innovation for inclusion.

Inclusive innovation proper

The initial and most widely recognized definition of inclusive innovation refers to the economic development context, and specifically to poverty alleviation and bottom-of-the-pyramid considerations (Chataway et al., 2014). From this starting point, most recent definitions of inclusive innovation have extended the definition more broadly to include generally excluded groups of society:

> "Inclusive innovation is the means by which new goods and services are developed for and by marginal groups (the poor, women, the disabled, ethnic minorities, etc)." (Foster & Heeks, 2015)

> "[T]he development and implementation of new ideas which aspire to create opportunities that enhance social and economic wellbeing for disenfranchised members of society." (George et al., 2012)

Using these definitions, the concept of inclusive innovation may seem limited to ensuring excluded groups of society are considered as customers, and maybe producers of innovations. However, the central tenet of this article is that such an interpretation would be overly simplistic and, based on prior experience and current statistics on exclusion, not likely to be effective. This recognition has given rise to the current academic and policy interest in inclusive innovation. The framework proposed below will outline four dimensions of inclusiveness and show that even the concept of including groups within the innovation process can take many forms. For example, inclusion can be conceptualized as consideration as potential customers, participation in the innovation process, and contribution to the evolution of innovation and societal systems (Foster & Heeks, 2015; Fressoli et al., 2014).

Innovation for inclusive growth

Some authors use the terms "inclusive innovation" and "innovation for inclusive growth" interchangeably (George et al., 2012), especially where the context is economic development or bottom-of-the-pyramid considerations. However, many other authors make it clear that "inclusive growth" is a certain type of economic growth, which would consequently mean that inclusive innovation by this definition would be innovation targeted primarily at economic outcomes for certain demographics.

As we will argue in more detail below, retaining the broader consideration of social and environmental outcomes and inclusiveness along other dimensions is central to the concept of inclusive innovation. In that context, the consideration of innovation for inclusive growth does, however, provide an important delineation of circumstances under which the economic outcomes of

innovation can be considered as inclusive. Table 1 provides some of the definitions commonly used in the innovation for inclusive growth literature.

Table 1. Definitions of inclusive growth

Definition	Source
"growth that not only creates new economic opportunities, but also one that ensures equal access to the opportunities created for all segments of society, particularly for the poor."	Ali & Son (2007)
"economic growth that creates opportunity for all segments of the population and distributes the dividends of increased prosperity, both in monetary and nonmonetary terms, fairly across society"	Planes-Satorra & Paunov (2017) (OECD)
"More formally, an inclusive growth episode requires - positive per capita income growth rates; - primary income […] growth rates for predefined, disadvantaged groups […] at least as high as growth rates for per capita incomes, indicating that such groups have been able to participate in the growth process at least proportionately; and - expansions of non-income dimensions of well-being that exceed that average rate for pre-defined disadvantaged groups […]; this would ensure that an income growth episode was disadvantage reducing."	Klasen (2010)

Klasen (2010) provides an extensive discussion of options to define inclusive growth. Key distinctions are whether only income is considered, or whether non-income dimensions are also included, and whether growth can be considered inclusive if it benefits all societal groups equally, or whether inclusiveness of growth necessarily required the reduction of inequalities.

The broad interest in innovation for inclusive growth by authors from several fields (Ali & Son, 2007; Carayannis & Rakhmatullin, 2014; George et al., 2012; Hall et al., 2012; Mazzucato, 2013; Planes-Satorra & Paunov, 2017) has led to a slight blurring of definitions between inclusive innovation and innovation for inclusive growth. However, conceptually, innovation for inclusive growth is clearly anchored in the economic growth literature and as such only addresses a small subset of the issues raised by inclusive innovation.

Definition within responsible research and innovation

Research on RRI has developed several frameworks and methods to ensure and assess responsibility within science, technology, and innovation contexts. One framework in particular, that of Stilgoe and colleagues (2013), makes explicit reference to inclusiveness. The framework consists of four closely related dimensions that are important characteristics of responsive innovation. The first dimension, anticipation, requires ex-ante consideration of not only the potential of new technologies, but particularly also the risks new technologies may pose. Beyond technology assessments and forecasting, it also requires early involvement of the public to ensure pathways of technological development are aligned with societal expectations and needs. The second dimension, reflexivity, highlights that responsibility demands engaging critically with institutional practices within science, and with the value systems that underlie scientific and technological creation. The third dimension, inclusiveness, reflects the waning authority of expert, top-down science and policy development, and suggests that legitimacy needs to be established through involvement of broad stakeholder groups and the public. The last dimension, responsiveness, emphasises that responsible innovation requires a "capacity to change shape or direction in response to stakeholder and public values and changing circumstances" (Stilgoe et al., 2013).

This framework is also adopted in European Commission work on measurement of RRI (Strand et al., 2015), which also adopts the von Schomberg (2012) definition. Although they do not focus solely on inclusiveness, the measurement categories outlined by Strand and colleagues (2015) give some indication of the kinds of inclusiveness the European Commission is focused on. The categories are: public engagement, gender equality, science education, open access, ethics, governance, sustainability, and social justice/inclusion.

Clearly, these definitions extend the concept of inclusiveness beyond simply inclusiveness of economic outcomes as the innovation for inclusive growth framework does. As we will argue below, the implications of consequent consideration of public engagement, gender equality, and sustainability – to name some of the key dimensions – suggest that more than economic growth needs to be considered.

This conceptualization of inclusive innovation – especially when it is assumed also to be anticipatory, reflexive, and responsive – addresses more of the concerns raised in the initial definition of inclusive innovation, but retains a narrow focus on technological innovation.

Summary

The preceding definitions of inclusive innovation are consistent in that they require the inclusion of previously excluded groups. The difference then lies in the way in which excluded groups are to be considered and to which extent the various dimensions of inclusion or exclusion are thematized in each model. Indeed, the literature places great emphasis on the nature of inclusion, highlighting the need of inclusion not simply as users or consumers of innovations, but also as producers, and designers of innovation (Chataway et al., 2014; Foster & Heeks, 2015; Heeks et al., 2014; Pansera & Martinez, 2017).

A second differentiating element is the type of innovation activities considered, and especially the role of technology in this regard. Much of the literature on inclusive innovation is deeply rooted in the science and technology literature, and as such has a strong bias towards good, service, or process innovations based on scientific or technological advances. However, numerous authors have challenged this narrow definition. Joseph (2014) argues that, in order to achieve the goal of inclusion, the focus needs to extend past the high-technology sectors, which are traditionally considered highly innovative, to also consider innovation in labour-intensive and labour-extensive sectors. Similarly, Foster and Heeks (2015) note that it should include sectors of particular importance to marginalized populations, such as health, education, and small-scale agriculture. However, to be truly inclusive, broader definitions are required. Paunov (2013) includes "not only R&D-based innovation but also innovation based on practice rather than formal R&D, and social and business innovations", and Dubé and colleagues (2014) include dimensions such as organizational, social, financial, and institutional innovation.

One of the drivers behind inclusive innovation is the social well-being of marginalized populations. Economic growth can be expected to alleviate a number of social issues, but history has shown that consideration of only economic outcome indicators is prone to lead to increasing inequalities and has created a strong motivation for the current trends towards more inclusive innovation. Thus, at a minimum, distributional effects of innovation need to be considered (Altenburg et al., 2009), but the more likely implication of inclusive innovation is that broader outcomes, such as quality of life (Bergeron et al., 2012), specific social outcomes, as well as environmental outcomes, need to be considered.

Finally, reflexivity with regards to the innovation process is a key emerging theme within the inclusive innovation literature. There is a clear call to consider innovating how we innovate (Dubé et al., 2014), even to the extent of challenging fundamental assumptions of the innovation process – such as the pursuit of consumption growth (Soete, 2013), competition between national systems of innovation (Schot & Steinmueller, 2016), and even assumptions that remain to be challenged as a consequence of the inclusion of new actors in the innovation process (Kuhlmann & Rip, 2014).

Dimensions of Inclusive Innovation

The summary above suggests that there are four dimensions – who, what, why, and how – along which innovation needs to be inclusive: people or groups of people included, the types of innovation activities included, a broad range of outcomes and benefits to be captured, and the governance mechanisms of innovation. In addition, the previous subsections highlight that inclusiveness cannot be superficial if it is expected to lead to positive impacts on inclusion – whether these are economic, social, or environmental outcomes.

Who: People

To answer the question of who should be included in innovation activities, two questions need to be answered: "Which groups of people should be included?" and "How should they be included?"

With regards to the first question – which groups to include – the literature refers to traditionally disadvantaged, marginalized, or excluded groups, although the main focus has been on the poor in developing countries, commonly referred to as the bottom of the pyramid (BOP) (Heeks et al., 2014). The definition of BOP is relatively consistently defined by incomes of $1.25USD per day or similar cut-offs (Chataway et al., 2014; Heeks et al., 2014). Translating the concept of inclusive innovation to countries other than developing countries, authors often rely on the concept of social exclusion (Sen, 2000) to define marginalized or excluded groups. Commonly targeted groups for inclusive innovation interventions include women, youth, the disabled, ethnic minorities, and informal sector entrepreneurs (Heeks et al., 2014), or those defined by industrial or territorial boundaries (Planes-Satorra & Paunov, 2017).

However, there is a risk that this approach will focus only on groups that historically faced social exclusion, and that it may ignore groups that are or will be affected by arising societal, technological, and broader innovation trends. A much-debated example demonstrating the importance of this is the pressure exerted by the introduction of artificial intelligence into the workplace. Innovations based on artificial intelligence have begun to replace jobs and are projected to substantially transform the labour landscape in coming years. The types of jobs affected will not be based on historical social exclusion, but rather on the potential of artificial intelligence to outperform humans. In fact, one of the earliest groups affected by artificial intelligence is financial traders on the stock market. Arguably, these were highly coveted jobs in the financial industry, with a high representation of individuals of high social inclusion status. Current projections further suggest that many of the jobs anticipated to become obsolete by this wave of innovation are well-paying, secure jobs, often currently held predominantly by men, such as jobs in the manufacturing sector, truck drivers, etc.

Thus, inclusiveness in the context of innovation and innovation policy needs to be both anticipatory and historically based, and ensure that not only historically excluded groups are considered, but that groups currently under pressure or predicted to be negatively affected by innovation trends are carefully considered in innovation conversations. It also needs to take into account that the means of social exclusion are changing, through widespread digitization and the use of big data analytics to define included and excluded populations.

With regards to the second question – how these groups should be included – Heeks and colleagues (2013) propose a framework with six levels. At the most basic level, *intention*, innovations address needs, wants, or problems of the focal group. The second level, *consumption*, refers to the focal group as users of an innovation, implying that the group can access and afford the innovation and has the motivation to adopt it. The third level, *impact*, sees an innovation as inclusive if it has positive impact on the focal group. Such impact is broadly defined and can include economic perspectives, well-being, capability increases, and others. Level four, *process*, sees inclusion of the group in the development of the innovation, with sub-levels distinguishing between being informed, being consulted, collaborating, being empowered, and controlling the development of innovation. Level five, *structure*, goes beyond individual innovations and focuses on the inclusiveness of institutions, organizations, and relations that make up innovation systems. Finally, level six, *post-structure*, acknowledges that innovation occurs within a frame of knowledge and discourse, which serves as the foundation of power distributions at the source of societal outcomes. Inclusive innovation in its most meaningful definition would occur in a context where diverse knowledge frameworks of all groups determine the structures, processes, and manifestations of innovation.

To illustrate these concepts, questions regarding the level of inclusion have been debated in the context of the inclusion of women in science and technology and more specifically in innovation. Nählinder and colleagues (2015) conducted a study on definitions of innovation and gender distribution of innovation characteristics. Notably, they found that women were less innovative than men using common definitions of innovation. However, when women's perspectives were integrated into the conceptual framing of innovation (i.e., they were included at level six, post-structure, in the model by Heeks and colleagues [2013]), such differences disappeared. Similar needs for post-structural inclusion can be expected with regards to any group to be included, which, of course, raises the difficult question of how to accomplish transitions to more inclusive frameworks without creating new dimensions of exclusion.

Another consideration from the gender context, which may hold true on a much broader level, is the consideration of mutual influences between existing innovation systems and newly included groups. At a time when women were increasingly involved in both consumption and production of science and technology, Franklin (1985) asked: "Will women change technology or will technology change women?". With regards to inclusion of economically disadvantaged groups, evidence (Chataway et al., 2014) suggests that inclusion of subsets of the bottom of the pyramid does not lead to systemically improved consideration of poverty.

Thus, we argue that inclusive innovation has to be anticipatory in its definition of groups to be included and open to engage at the structural or post-structural level of inclusion to be effective.

What: Activities

Current and past academic and policy conversations on inclusive innovation focus on science and technology-based innovations, and their commercialization pathways. Commonly referenced examples for inclusive innovation activities include "the provision of grants to researchers from disadvantaged groups, the deployment of programmes to popularise science and technology, the provision of micro-credit to entrepreneurs and the provision of grants to firms locating their R&D activities in peripheral regions" (Planes-Satorra & Paunov, 2017).

As the fundamental concern of inclusive innovation lies outside immediate economic growth considerations, it seems counterproductive to continue to only consider activities aiming at the commercialization of new products or processes as innovation. Even within the mainstream innovation literature, definitions of innovation are increasingly broad. One of the broader definitions has been proposed by the European Commission (1995): "innovation is taken as being a synonym for the successful production, assimilation and exploitation of novelty in the economic and social spheres".

Much earlier, in the early nineteenth century, Robert Owen aimed to address social concerns caused by the large mills in England's textile industry by introducing the organizational innovation of creating smaller mills that empowered the workforce and supported smaller communities (Chataway et al., 2014). Almost two centuries later, the combination of free and paid eye care offered in India through the Aravind Eye Hospital also addresses social concerns, but we might consider this innovation a fundamental business model innovation – combining process, some product innovation, organizational, and financial innovations.

At this time, a promising framework by Dubé and colleagues (2014) refers to the combination of technological innovation, organizational innovation, social innovation, financial innovation, and institutional innovation as "convergent innovation", although future work would be useful to better position appropriate frameworks within the current proliferation of types of innovation.

Why: Outcomes

Many contributions in the inclusive innovation literature in the broad sense begin by outlining the transition of policy expectations towards innovation from narrowly focused contributions to economic growth, through inclusion of context- and field-specific outcomes, such as health, environmental, or social outcomes, to the current expectations of innovation policy to contribute to solving grand societal challenges (Kallerud et al., 2013; Kuhlmann & Rip, 2014).

Capturing such outcomes of innovation is challenging (Martin, 2016) and has been subject to much academic research (refer to Strand et al. [2015] and Dubé et al. [2014] for initial references). Where health and environmental benefits are considered, there is also often a tendency to only capture positive impacts, leaving negative impacts among externalities not integrated into analysis and decision making.

In addition, the goal of inclusiveness complicates the consideration of outcomes even further, as the goal is often not only to improve overall health or social outcomes, but also to achieve greater equality in the distribution of outcomes. To date, distributional effects of both policies and specific innovations are rarely investigated (Altenburg et al., 2009), and should focus both on risks and benefits (Cozzens et al., 2009).

Finally, wholesome consideration of environmental impacts in particular makes it clear that the current paradigm of innovation is fundamentally tied to a "consumption growth path, which in its environmental impact and ecological footprint will be unsustainable in the developed world and increasingly so in the rapidly emerging country world" (Soete, 2013; also see Soete, 2010).

How: Governance

Most authors contributing to the literature on inclusive innovation acknowledge that inclusiveness is likely to have some implications on the institutions, structures, and mechanisms governing how innovation is implemented and conceptualized. Conceptualizations of these impacts range from the involvement of stakeholders in innovation policy, through changes in innovation processes and the need for institutional flexibility within innovation systems, to a vision for transformational changes to innovation systems.

The development of governance mechanisms allowing the inclusion of stakeholders in the innovation process is one of the more obvious starting points. Issues considered in this regard are how to align stakeholder interests (Edler & Fagerberg, 2017; Kemp & Never, 2017), how to develop coordinated policy mixes (Kivimaa & Kern, 2016; Rogge & Reichardt, 2016), and how to facilitate alignment of policy mixes with stakeholder interests (Schillo et al., 2017). In many countries, mechanisms exist to include stakeholders for example through various advisory councils (Edler & Fagerberg, 2017) and consultation processes. However, the stakeholders invited to join such councils or participate in consultations are typically representatives of key organizations along existing value chains. As such, this kind of inclusiveness tends to reinforce existing structures of inclusion and exclusion rather than offer opportunities for the inclusion of excluded groups.

A more fundamentally inclusive consideration would not only question such existing structures, but also the processes currently used to innovate. For example, an emerging literature challenges the importance of speed in the innovation process (Vogt, 2016; Woodhouse, 2016) and suggests that achieving societal outcomes will depend more on the "capacity to innovate in the way we innovate than on accelerating technology development" (Dubé et al., 2014).

Substantial changes to the way innovation occurs will also require institutional flexibility in the innovation system (Andersen & Johnson, 2015) along the lines of the better governance principles and processes called for by the RRI literature (Owen et al., 2012; Stilgoe et al., 2013; von Schomberg, 2012), including "anticipation, participation, deliberation, transparency—to ensure that the process and direction of R&D and innovation better take into account societal preferences and concerns around ethics, sustainability" (Edler & Fagerberg, 2017).

Perhaps most importantly, however, inclusiveness in the broad sense outlined in all four dimensions presented here is likely to imply transformative change within innovation systems (Schot & Steinmueller, 2016). As Kuhlmann and Rip (2014) emphasize, inclusive innovation is not simply a funding priority within R&D policy, but rather "open-ended missions, and missions concerning the socio-economic system as a whole, even inducing (or requiring) system transformation" (Kuhlmann & Rip, 2014).

Conclusion

This article has provided an overview of conceptualizations of inclusive innovation and presented a framework of four dimensions of inclusivity. It shows that inclusivity is not simply a matter of selling innovative products to socially excluded groups, or integrating small numbers of individuals from excluded groups within dominant innovation structures and processes. As previous experiences with appropriate technologies and BOP programs suggest, complementing the existing system with additional BOP programs will not solve the issue of poverty, nor can it address the globally increasing inequality. Without increased reflexivity, the current paradigm of innovation can be expected to reinforce current structures in many areas. To achieve any different outcomes, we need to develop the capacity to innovate how we innovate (Dubé et al., 2014).

It is clear that much remains to be discovered about inclusive innovation. This is not only the case due to a dearth of empirical data and even measurement frameworks, but also because inclusive innovation policy and practice require a fundamental openness to experimentation and adaptation. Perhaps most importantly, empirical and further theoretical development needs to involve groups and viewpoints not currently represented in the inclusive innovation literature. This literature has been heavily influenced by a relatively small group of primarily white men and some women – a limitation also affecting this article. From this perspective, the framework proposed in this article presents a step towards greater inclusiveness. Future theoretical or empirical academic work by more diverse groups of authors and practitioners may provide important new dimensions or reconceptualizations. In addition, implementation of this framework into policy and program development should be preceded by its critical evaluation by all relevant stakeholder groups and careful integration of feedback received.

Although the concept of holistic inclusive innovation has been juxtaposed to the current dominant innovation structure throughout this article, it is important to note that many of the drivers towards increased inclusivity are in place, and many examples exist of successful implementation of inclusive innovation initiatives or programs (Goel, 2011). Indications are that even if the transition towards inclusive innovation will neither be effortless nor automatic, inclusive innovation provides a plausible scenario for increased social and environmental sustainability on a global level.

Acknowledgements

The authors would like to thank Louise Earl and Jeff Kinder for insightful discussions on inclusive innovation.

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Keywords: developed countries, framework, inclusive innovation, inequality, social exclusion

Topic: Managing Innovation

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 ISSN: 1927-0321 Formerly the *Open Source Business Resource*

EXHIBIT 8

Springer NANOETHICS springer.com

Nanoethics. 2016; 10: 177–188. PMCID: PMC4949307
Published online 2016 Jun 9. doi: 10.1007/s11569-016-0265-2 PMID: 27478517

Responsible, Inclusive Innovation and the Nano-Divide

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Received 2015 Oct 30; Accepted 2016 Apr 15.

Abstract

Policy makers from around the world are trying to emulate successful innovation systems in order to support economic growth. At the same time, innovation governance systems are being put in place to ensure a better integration of stakeholder views into the research and development process. In Europe, one of the most prominent and newly emerging governance frameworks is called Responsible Research and Innovation (RRI). This article aims to substantiate the following points: (1) The concept of RRI and the concept of justice can be used to derive similar ethical positions on the nano-divide. (2) Given the ambitious policy aims of RRI (e.g. economic competitiveness enhancer), the concept may be better suited to push for ethical outcomes on access to nanotechnology and its products rather than debates based on justice issues alone. It may thus serve as a mediator concept between those who push solely for competitiveness considerations and those who push solely for justice considerations in nano-technology debates. (3) The descriptive, non-normative Systems of Innovation approaches (see below) should be linked into RRI debates to provide more evidence on whether the approach advocated to achieve responsible and ethical governance of research and innovation (R&I) can indeed deliver on competitiveness (in nano-technology and other fields).

Keywords: Responsible research and innovation, Systems of innovation approaches, Inclusive innovation, Innovation governance systems, Nano-divide

Introduction[1]

Academics, innovators and policy makers have for decades been interested in the dynamics that have made Silicon Valley a success (see also Table 1). Innovation and innovation systems are now becoming increasingly interesting to policy makers in order to achieve their economic and social goals.[2] In Europe, "79 % of companies that introduced at least one innovation since 2011 experienced an increase of their turnover by more than 25 % by 2014" [1].

Table 1

Systems of innovation approaches

National Systems of Innovation (NSI)
Adopting a holistic view of innovation rather than focussing on isolated aspects of the process, the NSI concept emphasises the interaction of actors involved in innovation and analyses how these interactions are shaped by social, institutional and political factors [49]. NSI was remarkably successful in a short period of time and is now being used in academia and policy contexts [50]. It is often used as an analytical framework [51] for studying the differences between countries concerning their production and innovation systems [52].
Regional Systems of Innovation (RSI)
The NSI approach (above) assumes homogeneity within countries, but this is not necessarily the case. On many indicators (e.g. economic performance, poverty, R&D investment), countries can differ significantly within their own boundaries. As a result, researchers and scholars of innovation systems have developed a regionally based approach of innovation system thinking, with 'regions' usually referring to a geographical area within a country. In some instances, cross-border regions are also possible, the Saar Lorraine region being an example, which spreads across France and Germany and shows considerable collaboration in local economic affairs. The research focus in the Regional Systems of Innovation (RSI) concept therefore rests on the relationship between technology, innovation and industrial location [53]. This spatial concentration remains important for innovative activities, despite the argument that modern information and communication technologies would render spatial distances between communication partners unimportant [54]. Silicon Valley is normally used as the prime example of a region with great innovative potential.
Sectoral/Technological Systems of Innovation (S-TSI)
Unlike the innovation system approaches described above, which both rely on a spatial dimension to define their boundaries, the sectoral/technological innovation system approaches adopt either a certain technology (spanning multiple sectors) or the sector in which it is used (including various technologies) as their system boundary. The notion that particular sectors have different technological trajectories was first spelt out by Dick Pavitt [55]. The concept of sectoral innovation systems was further developed by Malerba [56], whereas the development of the technological approach can be traced back to Carlsson and Stankiewicz [57]. Both concepts are less developed than the NSI and the RSI approaches and have a smaller overall impact. In both sectoral and technological systems of innovation, links between firms and other organisations are portrayed as occurring as a result of the technological interdependence of their knowledge [58].

As a result, policy makers from around the world are trying to emulate successful innovation systems in order to support economic growth. At the same time and following negative societal responses to genetic modification around the world, innovation *governance* systems are being put in place to ensure

a better integration of stakeholder views into the research and development process. In Europe, one of the most prominent and newly emerging governance frameworks is called Responsible Research and Innovation (RRI) [2].

This article is in four parts. The first part provides background, definitions and clarifications about the terms innovation, innovation systems and responsible research and innovation. The second part will consider the question of the nano-divide with reference to RRI. The third part will introduce the concept of inclusive innovation to bridge the gap between innovation systems and RRI. Finally, the conclusion will substantiate the following three points:

1. The concept of RRI and the concept of justice can be used to derive similar ethical positions on the nano-divide.[3]
2. Given the ambitious policy aims of RRI (e.g. economic competitiveness enhancer), the concept may be better suited to push for ethical outcomes on access to nano-technology and its products rather than debates based on justice issues alone. It may thus serve as a mediator concept between those who push solely for competitiveness considerations and those who push solely for justice considerations in nano-technology debates.
3. The descriptive, non-normative Systems of Innovation approaches (see below) should be linked into RRI debates to provide more evidence on whether the approach advocated to achieve responsible and ethical governance of research and innovation (R&I) can indeed deliver on competitiveness (in nano-technology and other fields).

Innovation, Innovation Systems and Responsible Research and Innovation

Innovation has been defined as follows:

> *Innovation is an activity or process which may lead to previously unknown designs pertaining either to the physical world (e.g. designs of buildings and infrastructure), the conceptual world (e.g. conceptual frameworks, mathematics, logic, theory, software), the institutional world (social and legal institutions, procedures and organisation) or combinations of these, which—when implemented—expand the set of relevant feasible options for action, either physical or cognitive [3].*

Innovation is widely regarded as the key ingredient to national economic success. For instance, China, the country which was most successful worldwide in terms of economic growth in 2013 (7.7 %) [4], recently launched structural adjustment policies to move from manufacturing growth towards a knowledge and innovation economy. In 2012, the 18th National Congress of the Communist Party of China proposed a reform of the science and technology system to improve the potential for innovations across all sectors [5].

As innovation has become central to economic success, policy makers and researchers are increasingly interested in understanding what factors enhance innovation. A range of descriptors have emerged for fields that examine the innovation process from knowledge creation to commercialisation (e.g. innovation studies, science studies, science and innovation studies, science and technology studies). One of the fields' most prominent outputs is the Systems of Innovation approach. The three main Systems of Innovation approaches are the National Systems of Innovation approach (NSI), the Regional Systems of Innovation (RSI) approach and the Sectoral/Technological Innovation Systems approach (S-TSI; see Table 1).

Apart from the distinctions given in the above table, all three Systems of Innovation (SI) approaches share certain characteristics. They all place great emphasis on the learning process [6], in which all actors involved (e.g. firms, consumers, universities, public organisations) experience 'learning-by-doing' or learn from each other by exchanging knowledge. Systems of innovation are always defined as complex systems [7], stressing their non-linear, systemic, interactive and evolutionary character [8, 9]. Furthermore, the performance of all SI approaches is analysed in a similar way, namely through the ex-post, historical analyses of economic or innovative activity and knowledge diffusion [10]. Such analyses are holistic and interdisciplinary, bringing together scholars and analysts from various disciplines to account for the many and complex interactions in the system [6].

The attractiveness of SI approaches for policy makers is the fact that they can draw attention to strengths and weaknesses in the innovation system [11]. However, it is important to emphasise that SI approaches aim to be purely descriptive. These approaches investigate which actors belong to the system, which networks are formed, what the boundaries of the system are, which knowledge is generated and which internal dynamics can be observed [12]. In other words, whilst SI research might describe normative behaviour when found in the innovation process, it tries not by itself to generate any normative conclusions. For instance, policy makers could use research from innovation studies in making funding or tax incentive decisions, based on, for example, the reasoning that successful innovation systems have the potential to reduce unemployment and thereby poverty. For instance, a scheme that provides tax incentives to innovators who are most likely to be successful according to SI research could be defended with reference to job creation and its potential for poverty reduction.

However, innovation is not only seen as a desirable driver of economic growth and prosperity. It can also be highly contentious and even adversarial, particularly in the context of new and emerging technologies, where significant risks for humankind, the environment, local populations, and researchers can occur. It is in this context that the field of Technology Assessment (TA) has been developed [13] and enhanced [14] as a key mechanism to govern science and innovation. However, by contrast to the emergence of TA, which was highly expert-driven, newer concepts of innovation governance aim to involve more stakeholders in the innovation process.

In recent years, the new governance framework of RRI or Responsible Innovation (RI) has become prominent in Europe. The European Commission is highly active in supporting models which govern research and innovation in such a way that societal concerns and interests are taken into account. The ‘Science with and for Society’ (SWAFS) programme has produced one of the most influential RRI definitions in Europe.

> *RRI is an inclusive approach to research and innovation (R&I), to ensure that societal actors work together during the whole research and innovation process. It aims to better align both the process and outcomes of R&I, with the values, needs and expectations of European society. In general terms, RRI implies anticipating and assessing potential implications and societal expectations with regard to research and innovation [2].*

The European Commission, which promotes RRI, is also the organisation which drives European competitiveness.

> *The European Commission places great emphasis on competitiveness, given its importance in creating jobs and growth in Europe. It works to mainstream industry-related competitiveness concerns across all policy areas [15].*

It is noteworthy that RRI has been linked to increased economic competitiveness in a report published by the European Commission.

> *The consideration of ethical and societal aspects in the research and innovation process can lead to an increased quality of research, more successful products and therefore an increased competitiveness [3].*

The European Commission has also issued a range of funding calls to provide more evidence on the link between RRI and increased economic competitiveness. For instance, the call "Responsible Research and Innovation in an industrial context"

> *aims to contribute towards the innovation and competiveness objectives of the Innovation Union and to enhanced 'mainstreaming' and standardisation of RRI and CSR processes at the EU and global level.*[4]

Hence, the approach to research and innovation promoted by the European Commission through their understanding of RRI is closely linked to economic competitiveness.

Another RRI definition developed in Europe by Rene von Schomberg defines RRI as a

> *[T]ransparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society) [16].*

Amongst academics, the most prominent definition of RRI, which was agreed by European and US authors in a joint publication, is "Responsible innovation is a collective commitment of care for the future through responsive stewardship of science and innovation in the present" [17]. In implementing responsive stewardship, the following four RRI dimensions are necessary, according to the authors: anticipation, reflection, deliberation and responsiveness.

What all three definitions of R(R)I have in common is that they demand the involvement of a variety of societal actors in the innovation process. They also stress the importance of care, responsiveness and aligning innovation with societal values and needs.

In this article, we will focus on one essential element from each definition and link them to nano-technology. From the SWAFS definition advocated by the European Commission, we will focus on societal needs, which we will interpret as global societal needs.

It might be asked why we would jump from the "needs… of European society" to the needs of global society. There are many reasons for doing so, including a large literature on cosmopolitanism, but we shall focus on two reasons that can be specifically related to nano-technology.

Considering *only* the needs of societies at a national or regional level within innovation governance frameworks disregards the responsibilities Northern states have, historically and currently, for the societal needs of Southern states. Thomas Pogge has successfully illustrated a network of obligations from North to South with concrete examples, which show that these duties do not derive from obligations of benevolence or charity [18]. Intellectual property rights are one instance where innovation governance frameworks systematically favour high income over low- and middle-income countries [19]. Hence, if innovation governance frameworks that structurally favour one set of agents, including nano-technology innovators, are already in place globally (such as the IPR system), one cannot reasonably limit the extension of another innovation governance framework (RRI) to favour the same set of agents yet again, by limiting it to only regional (European) significance.

More specifically, and in relation to nano-technology, it has been argued that "Nano-technology can be harnessed to address some of the world's most critical development problems, … [including] challenges faced by the 5 billion people living in the developing world" [20]. Indeed, in a globalised world, one cannot reasonably ignore the potential of a technology for impacting on the lives of the most vulnerable people on Earth, by restricting a discussion on its development to the needs of European society. Hence, whilst we use one element from the SWAFS definition of RRI (needs), we believe that its restricted focus on Europe cannot be justified, and we therefore expand the scope of our discussion to be global.

From the von Schomberg definition, we will focus on societal desirability, which we define as follows: "An innovation is societally desirable, if it can benefit all human beings without discrimination". One could ask why we interpret 'societal desirability' to relate to innovations that can benefit all human beings without discrimination. Is that not too demanding? Societal desirability is an inadequately defined term in the literature. Its strong advocate, Rene von Schomberg, has linked it to the right impacts and outcomes of research [16]. Trying to answer what such impacts and outcomes would be, he links societal desirability to the grand challenges of humankind, for instance, climate change, public health, pandemics and security [16].

That is one possible answer, but it is both more demanding than our suggestion and also restricts the number of societally desirable innovations even further. Our interpretation of societal desirability does at least leave the door open for innovations that have the potential to benefit all of humanity without addressing the grand challenges. For instance, Information and Communication (ICT) tools to improve pre-school learning have the potential to benefit all human beings without relating to a grand challenge of humanity. Hence, our take on the societal desirability criterion of RRI is less ambitious than Rene von Schomberg's, and we therefore assume that taking it forward in this article is reasonably justifiable.

This is not to say however that *all* innovation has to be targeted in such a way that *all* of humankind must *always* potentially benefit from it. We believe that von Schomberg's societal desirability criterion simply has the potential to widen the sphere of potential beneficiaries of research and innovation and that such an extension of the concept will distinguish highly responsible from less responsible innovation.

One could also ask whether societal desirability is not the same as ethical acceptability. Obviously, it is ethically acceptable for all of humankind to benefit from innovations without discrimination. And, after all, ethics is the study of *all* moral principles and systems as well as the study of right and wrong conduct. Hence, any researcher and innovator responsibilities could fall under this heading. However, to understand what RRI implies, it is important to divide it into more easily understandable pieces. Even though the above broad understanding of ethical acceptability is plausible, we shall use the term here in a more limited manner. For the purposes of this paper, ethical acceptability will be equated with the demand to not fundamentally transgress societal values, which includes compliance with research ethics (e.g. do not exploit research participants). This means it is understood in a limiting way, linked to "doing no harm". By contrast, societal desirability is understood as "doing good". For instance, Article 15 (1) of the UNESCO Declaration of Bioethics and Human Rights requires that

> *Benefits resulting from any scientific research and its applications should be shared with society as a whole and within the international community, in particular with developing countries [21].*

This relates to societal desirability, whilst most other articles in the declaration relate more directly to ethical acceptability (e.g. Article 4 on harm, Article 6 on consent).

Thirdly, we will focus on responsiveness, which Owen et al. interpret as

> *[U]sing a 'collective process of reflexivity to both set the direction and influence the subsequent trajectory and pace of innovation, through effective mechanisms of participatory and anticipatory governance. This should be an iterative, inclusive and open process of adaptive learning, with dynamic capability' [17].*

One might wonder what an iterative, inclusive and open process of adaptive learning with dynamic capability would look like; how expensive it would be; and how successful it could be. However, such questions are related directly to critiques of the definitions themselves. Here, we shall simply examine their application in our nano-technology case study.

Our first two RRI elements (societal needs, societal desirability) are therefore *outcome* or output based. The innovation output is intended to relate to global societal needs and have the potential to benefit all human beings without discrimination. The third RRI element we are considering here, responsiveness, describes the ideal *process* by which to define what counts as a global societal need and what counts as benefitting humankind without discrimination.

The Nano-Divide; Societal Needs, Societal Desirability and Responsiveness

Some people predict that nano-technology will be at the centre of the next significant innovation wave with its 'revolutionary' potential in terms of its impact on industrial production [22]. One of the main ethical criticisms of nano-technology is summarised in the term 'nano-divide', which has been used since at least 2001 [23]. It refers to differing access to nano-technology between low-, middle- and high-income countries. A rather more politically loaded term is 'nano-apartheid' [24], which gives an indication of the emotive nature of this ethical debate.

The term nano-divide can be understood in two main ways, according to Cozzens and Wetmore [25]. First, the 'nano-innovation divide', which refers to "inequity based on where knowledge is developed and retained and a country's capacity to engage in these two processes", and second, the 'nano-orientation divide', which refers to "inequity based on the areas in which nano-technology research is targeted". Hence, one use of the term relates to the capacity for nano-technology development and commercialisation, whilst the other is about the distribution of benefits from its use.

Societal needs, societal desirability (understood as the potential to benefit all human beings without discrimination) and responsiveness are the RRI criteria we have selected for a discussion of the nano-divide. The first two RRI criteria we specified focus solely on Cozzens and Wetmore's second understanding of the nano-divide, namely the *targets* of nano-technology. In other words, societal needs and the potential of innovation to benefit all human beings without discrimination are linked to the benefits of the use of nano-technology. Is research targeted at clean water or improved cosmetics? These criteria are not directly linked to the capacity to undertake nano-technology research.

Responsiveness, on the other hand, would be required in relation to both understandings of the nano-divide. First, some technologies might not be acceptable to the public in the first place, in which case the required collective reflection would focus on the question of "what futures do we collectively want science and innovation to bring about and on what values are these based?" [17] Second, to give direction to individual innovations requires the iterative, inclusive and open process Owen et al. envisage when they define responsiveness in innovation. Hence, the three criteria from RRI definitions we have chosen have the potential to cover the same ground as the debates Cozzens and Wetmore have surveyed to develop their distinction.

Both understandings of the nano-divide have already been discussed widely in nano-ethic circles. For instance, Celine Kermisch has asked: given that nano-technology is likely to offer advances in areas of significant benefit to low- and middle-income countries such as new medicines (better HIV retrovirals is one of her examples), is there a moral obligation to share such life-enhancing technologies? [26]

Note, she does not ask whether to share the outputs of nano-technology innovation but the technology itself. In other words, she does not talk about providing access to medicines but about sharing the technology to develop them.

At the same time, when the nano-industry itself advertises potential applications, the focus is on the sharing of innovation outcomes rather than technology sharing. For instance, a report from the Nanotechnology Industries Association indicates that use of nano-technology could transform the remote and poverty-stricken areas of the world with innovations such as water nano-filters, 'labs on a chip' that could assist rural doctors, cheaper drugs, batteries that utilise nano-technology for longer life, improved pesticides and fertilisers, environmental nano-cleansing of contaminated ground, lightweight construction materials that can be transported more cheaply and better food storage packaging [27].

The gap between real-life innovations and aspirations to develop innovations to assist the under-privileged is often the target of criticism. For instance, it is argued that to date, most nano-technology innovations have been directed at high-income world products that are more profitable, such as self-cleaning glass, tennis balls and cosmetics, and thus, nano-technology has been condemned for its potential to advance Northern consumerism whilst creating few products aimed at benefitting the poor [28]. In this context, Geoffrey Hunt asks "can we at last… make an international cooperative effort to put nano-technological developments at the service of human and ecological welfare, or will it be primarily nano-technology for more over-consumption?" [29].

The combination of high-tech innovation potential with possibly enormous societal, medical and environmental impact has always offered an uneasy dilemma for society, and more specifically policy makers, about whether profitability or tackling world societal challenges might be more important [30].

When approaching the nano-divide from a distributive justice point of view,[5] it has been argued that access to nano-technology might come to be seen as a right of citizenship, in the same way as access to medical care [31]. "If nano-technology really is as revolutionary as proponents suggest, then both justice and a concern for the stability of any global political order require that we negotiate the challenges of the nano-divides" [31].

This summarises the discussion of the nano-divide from a philosophical perspective. But, is there anything instructive one can learn from approaching the nano-divide from an RRI angle? We want to focus on two points.

First, RRI is a research and innovation governance framework on the rise in Europe, developed—amongst others—by the European Commission, the institution which works to improve economic competitiveness, as noted above. Hence, if the same institution was to push both for profitability *and* addressing societal challenges through innovation focusing on societal needs, the audience reached with information about the nano-divide would probably be larger. In other words, the European Commission might command a larger audience of listeners and readers, and have more influence, than the authors of philosophical papers and books. For instance, one could venture that industry is more interested in pronouncements from the European Commission than the arguments of distributive justice philosophers. Of course, one has to note that the European Commission's own definition of RRI focuses solely on the "needs and expectations of *European* society" [2] (our emphasis). For the reasons given above, however, this is unjustifiably Eurocentric in a world where innovation governance frameworks have historically been rolled out to the detriment of low- and middle-income countries and to the benefit of Europe (and other high-income regions). Hence, RRI combined with some basic justice considerations[6] could provide an angle on the nano-divide that comes from an institution known for its focus on economic competitiveness.

Second, if one discusses competitiveness, the nano-divide and RRI in the same breath, one is situated more harmoniously in the centre rather than at either end of another important debate, the benefits and challenges of patents. In terms of a sole focus on competitiveness from a high-income country perspective, one would argue that patents rightly bar entry to competitors in order to "provide the innovator firm with an opportunity to price above the marginal cost and thereby recoup R&D expense" [32]. In terms of a sole focus on the nano-divide, one would stress the access problems of low- and middle-income economies and related unmet human needs. RRI could be seen as a mediator concept here, which tries to combine a concern for competitiveness with a concern for the satisfaction of needs.

The trickle-down effect has often been used to try and marry the concerns of profitability and societal desirability, arguing that what initially benefits the rich will become available to poorer populations later. In the context of nano-technology, it is "likely that many of the benefits nano-technology can provide to the developing world will be delayed by at least a generation or more—the 20-year term of a patent" [33]. Kathy Wetter argues that researchers and innovators in the South are likely to find that participation in the proprietary nano-technology revolution is "highly restricted by patent tollbooths, obliging them to pay royalties and licensing fees to gain access" [34]. However, a survey of global nano-health patents filed between 1975 and 2004 showed that China owned 20 % of internationally filed patents, second only to the USA (33 %) and ahead of Germany with 13 % [35].

An example of where nano-technology research takes place in a lower middle-income country focused on a societal challenge is in South Africa, where tuberculosis (TB) is the leading cause of death. Approximately 80 % of the population have latent TB, and the incidence of drug-resistant TB is also a major concern [36]. TB is curable but only with long drug courses (6 months for standard TB and 2 years for drug-resistant TB) that are well supervised. Researchers in South Africa are therefore working on a way to incorporate tuberculosis drugs into nano-particles so that they are released slowly into a patient's bloodstream, raising the possibility that a regime of daily pills could be replaced by a single weekly dose. Despite the expense of development, "the potential advantages of the technology make its pursuit worthwhile. If TB treatment is reduced to a once-a-week dose, the overall costs, both of the drugs and of employing healthcare staff, could be significantly reduced" [37].

A 2013 Nanotechnology Industries Association Report is optimistic about the resolution of the nano-divide, claiming that

> *Nano-technology is still in its infancy and will take time to deliver on its promises. The developing world will also need time to appropriate the technology so as to make the most out of it and to boost its economies. Global inequality shall not be widened by nano-technology in and of itself; nevertheless, nano-technology offers a positive influence in reducing the divide between the rich and the poor by providing new approaches to tackle the challenges faced by the developing world, and as such, its impact will vary according to how it is implemented [27].*

Discussing the nano-divide in the context of RRI might broaden the debate by moving from discussions about pure justice to larger RRI discussion circles. Yet, the debate could be broadened even more if innovation systems could be included within it, as these are of prime interest to policy makers and are allegedly descriptive or non-normative.

The Nano-Divide, Innovation Systems and Inclusive Innovation

As noted above, the (SI) approach is the predominant approach by which researchers and policy makers try to make sense of successful innovations which emerge from a whole network of enabling conditions. SI approaches aim to be purely descriptive or at least without explicit normative elements. By contrast, the nano-divide is a discussion almost exclusively about normative elements. Who *should*

have access to the technology and the outputs of the technology, given that the market will not secure coverage for all those who need it?[7] In this regard, the two debates stand at different poles of a spectrum. How could they be combined?

SI research is used by policy makers to steer the system so that innovation can flourish. In this regard, we have a link to RRI. RRI is an approach promoted by policy makers to guide innovation once it is happening; hence, one step after SI research helps to analyse the system. However, there is a third area of research interest that could fit into these debates, inclusive innovation. Inclusive innovation combines elements from innovation research with a strong, explicit normative element.

Following the Millennium Development Goals[8] [38], which sought to improve the economic and social position of the poor, there has been an upsurge of interest in 'pro-poor' or 'inclusive' growth. Since innovation plays a key role in growth and in determining the character of growth and the distribution of its benefits, increasing attention has been paid to innovation policies and practices that have the potential to assist the poor.

The term 'inclusive innovation' is now very widely employed. International agencies such as the World Bank have embraced the term, and the United Nations Development Programme (UNDP) maintains an International Policy Centre for Inclusive Growth headquartered in Brasilia, Brazil. A large number of governments, notably in low- and middle-income countries—for example, India and Thailand [39]—have developed or are in the process of developing explicit policies focused on inclusive innovation. The Indian government characterised the 2010–2020 decade as the "Decade of Innovation" and created the National Innovation Council in 2011, with a specific brief to promote inclusive innovation at the national and state levels [40]. China's 12th Five Year Plan (2011–2015) shifts the focus from pursuing economic growth to sharing the benefits of development with all people, and innovation has a key role to play in this. Research organisations such as the Global Research Alliance have placed inclusive innovation at the centre of their objectives [41].

However, there is as yet no agreed definition of the term inclusive innovation, and indeed, a variety of similar terms are employed in different contexts. These terms include pro-poor innovation, below the radar innovation, bottom of the pyramid innovation, grassroot innovation and Jugaad or frugal innovation [42, 43].

What all of these terms have in common is that they refer to the production and delivery of innovative solutions to the problems of the poorest and most marginalised communities and income groups. Some definitions require that the poor are, in some way, actively engaged in the innovation process itself. A broad definition would therefore be "inclusive innovation is the means by which new goods and services are developed for and/or by the billions living on the lowest incomes" [44].

It is possible to conceive of a number of different levels at which 'inclusivity' could potentially operate.

a. The poor being engaged in the definition of the problems to be addressed such that the innovation is relevant to the needs of the poor;

b. The poor being actively engaged in some manner in the development and application of innovative solutions to their problems;

c. The poor being engaged in the adoption, assimilation and diffusion of innovative solutions to their problems;

d. The poor being engaged in the impact of innovation, such that the innovation outputs maximise the consumption and/or incomes of the poor [44].

Some protagonists and advocates of inclusive innovation look to the inclusion of poorer people as active participants in the processes of innovation [45]. This perspective also defines inclusive innovation in terms of the innovation *process* and not merely in terms of the *outcome*. It seeks innovative activity that, in some way, has the potential to enhance the capacities of poor people. As a result, they would not merely be passive recipients of innovation but instead be actively engaged. The active engagement of the poor in the innovation process finds its strongest expression in grassroot or community innovation movements. "Grassroot innovation movements seek innovation processes that are socially inclusive towards local communities in terms of the knowledge, processes and outcomes involved" [46].

At first sight, it looks as though RRI and inclusive innovation differ significantly. Inclusive innovation focuses almost exclusively on the needs of the poor, for instance, as beneficiaries of innovation or as co-innovators. By contrast, the term inclusive within RRI definitions has no pro-poor focus and is only one amongst many criteria that determine whether research and innovation is undertaken responsibly. For instance, the six key action points agreed by the European Commission's SWAFS' unit to determine whether research and innovation is undertaken responsibly are governance, public engagement, gender equality, science education, open access/open science and ethics [2]. Only one SWAFS report has added other action points, namely sustainability, and social justice/inclusion [47]. Hence, 'inclusion' plays a much smaller role in RRI than it does in inclusive innovation.

However, both inclusive innovation and RRI mirror the above conceptualisation of the nano-divide between innovation *for* and innovation *with* end-users. Inclusive innovation requires the development of new goods and services *for* the billions living on the lowest incomes whilst also requiring engagement *with* the poor in the development, adoption, assimilation and diffusion of innovative solutions for their problems. For RRI, the targeting of innovation at societal needs and the inclusion of end-users in innovation processes aims to achieve a better alignment of both the process *and* the outcomes of research and innovation with the needs of all of society.

If one tried to bring 'inclusive innovation' closer to RRI, one could argue that the term inclusion would require that *all* segments of society benefit from and influence innovation. 'Pro-poor' innovation, on the other hand, is a less suitable concept, as it focuses more clearly on one segment of the population only. Whilst one can provide strong arguments for an *exclusive* focus on the poor, as—for instance—John Rawls did with the difference principle[9] in his ground-breaking 'A Theory of Justice' [48], RRI definitions focus on the entire population. For instance, the European Commission defines RRI as "an inclusive approach to research and innovation", as noted above, not one that is focused on the under-privileged. Inclusive innovation is then not about the exclusion of richer populations from innovation and its benefits but about the broadening of the network positively impacted by innovation to include all.

Hence, RRI and inclusive innovation can be linked straightforwardly. However, what about the elusive link to the descriptive-only innovation systems approaches? From the brief account given above, we know that innovation system analysts try to find out, amongst other things, who is involved with which activities in innovation systems. As such, if policies such as RRI or inclusive innovation are successfully realised, innovation system analysts will find larger, more diverse networks, which also include new actors within their systems. If more population groups and more diverse end-user groups are included, for instance, the innovation system will grow. The important task for Systems of Innovation analysts is then to be sensitive to the pronouncement of RRI and inclusive innovation and its individual components (e.g. societal engagement, gender equality) in order to ascertain whether they improve innovation systems or not. If they can find convincing evidence, this would in turn validate the European Commission's SWAFS' unit claim that RRI is conducive to economic competitiveness.

Innovation system analysts are important contributors to the RRI debate, as they are best placed to ascertain whether policy makers' claims are valid. For instance, does the RRI governance framework indeed increase economic competitiveness? That is a very broad claim. Broken down into smaller claims would probably be more meaningful. Research from innovation system analysts would then answer questions such as: In which sectors is RRI likely to lead to enhanced economic competitiveness, if any? In which regions is RRI likely to lead to enhanced economic competitiveness, if any? Which role do certain actors play within the innovation system with regards to RRI?

As a relatively new concept, RRI needs statistical and case study support for the broad claims it makes, in particular for being able to marry increased social justice (e.g. gender equality, engagement, open access) with increased economic competitiveness.[10] Innovation system analysts are well placed to provide such data when assessing how responsible research and innovation case studies can be linked to existing approaches (see also Table 1). Likewise, proponents of inclusive innovation need statistical and case study support to ensure that their normative aims are reached. A possible next step for SI analysts in assisting the further development of RRI or inclusive innovation would be to co-develop relevant indicators that could be used, for instance, in computer-simulated models of innovation systems and innovation networks.

Conclusion

RRI and inclusive innovation inject moral values into innovation governance systems. Although there is no specific mention of justice in RRI, the implicit framing around justice concepts becomes obvious when one compares nano-divide debates from an RRI perspective and from a traditional philosophical justice perspective. Both approaches can arrive at very similar results. It is undesirable if a technology which has a major potential to improve the lives of the poorest people remains inaccessible to those countries and end-users who need them. Hence, to push for better access to nano-technology and its innovative outputs, one could use the concept of RRI, enhanced with some arguments from the philosophical justice literature. Given RRI's pedigree in Europe (namely its development from within the European Commission and therefore its close relationship to economic competitiveness efforts), using RRI pragmatically to push for broader access to nano-technology and its innovations may give better results than using justice arguments alone.

Footnotes

[1]Thanks for the helpful comments from two anonymous referees.

[2]For instance, a reduction in unemployment through economic growth.

[3]Considerations of justice are not often discussed in the context of RRI. An example exception is [38].

[4]http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/18099-garri-2-2015.html

[5]This article does not provide the scope to discuss the concept of justice in detail. For interpretations of different conceptions of justice relevant to international governance frameworks, see [59]. Distributive justice is relevant here, as it covers questions of access to technology. A typical distributive justice question is does international distributive justice require the sharing of advanced technologies with less technologically advanced communities in order to improve their prospects? Questions of corrective justice could be relevant where the less technologically advanced communities have been harmed by the more technologically advanced communities.

[6]A basic justice consideration here would be the Kantian demand not to violate perfect duties. See governance changes to the international intellectual property rights system [19] that predictably led to higher morbidity/mortality in low- and middle-income countries.

[7]In this article, we do not deal with the normative question of whether the technology should be used in the first place.

[8]On 25 September 2015, the Millennium Goals were superseded by the UN Sustainable Development Goals. The new agenda consists of 17 goals designed to end poverty and hunger by 2030 [60].

[9]The difference principle is based on a simple idea. Given that efforts to achieve full equality in society (which might be regarded as the most just outcome) will invariably lead to systematic and chronic inefficiencies, some inequalities will be allowed but only if they lead to advantages for the least well off. The difference principle would therefore allow higher salaries for surgeons if it could be shown that their services would not otherwise be available to the least well off.

[10]Thanks to John Weckert and Mary Walker for pointing out this tension.

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EXHIBIT 9

Social Media in the Workplace: Key Drivers for Inclusive Innovation

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ABSTRACT

The recent decade has witnessed a mass proliferation of information systems enabled, community-based, social networking. Such proliferation has contributed to seismic social and political movements around the globe, but is yet to make a noticeable imprint in business organisations. While many researchers and practitioners have advocated the transition of social media to the organisational sphere, the actuality of this transition is still deficient, necessitating thorough investigation. Consequently, this study addresses this pressing issue by first, presenting a vantage point on the theoretical and practical underpinnings of social media and the revolutionising role they stand to play in organisations. An empirical case study is then presented highlighting the actual diffusion and utilisation of social media in a regional branch of a global consultancy and audit firm. The findings hold important implications as they identify key drivers contributing to the successful diffusion of social media in organisations, and their corresponding utilisation for enabling an inclusive and innovative environment in the workplace.

Keywords

Collaboration, Diffusion and Utilisation, Inclusive Environment, Innovation, Social Media, Workplace

INTRODUCTION

Through successful implementation and utilisation of social media in the workplace, organisations could unleash an unprecedented potential to innovate and adapt to their environment (Culnan et al. 2010). The recent achievements and momentum witnessed in the social and political arenas present promising examples of the potential that social media could play in business organisations. Nonetheless, the premise of 'build and control' seems to be firmly entrenched in the business psyche. Such premise has been traditionally based on a top-down vision of devising a competitive strategy and imposing management and control mechanisms on subordinates to implement such strategy. In this pursuit, the mechanical metaphor of organisations (Morgan 2006) has played a major role in organisational success over the centuries. Much like the different components of an engine, the effectiveness and efficiency of each, is essential for achieving the intended objective. Notwithstanding its success, the metaphor presents several limitations, not least of which manifests in the essential specialisation and dedication of each component to a specific task with little or no access to the larger reality of the organisation and the holistic environment in which it operates. This was due to the fact that information flows were restricted to command and control structures with limited information by-passing such flows. Over the past two decades however, the world has witnessed an information revolution allowing for multidimensional information flows. In such context, many organisations are still unaware or unwilling to exploit the benefits presented by the new information rich environment, which requires a transition to an 'organic' modus operandi. An organisation here emulates an organism in an eco-system (Morgan 2006), constantly interacting with its environment, constantly learning, constantly evolving. This favours a web-of-inclusion (Helgesen 2005) approach to organizational management, where awareness, interaction, and innovation - enabled by information and communication technologies - are no longer restricted to senior management and top down structures, but are a core objective of all organisational actors. In particular, the diffusion of social media in the contemporary organisation is set to bridge the silos of knowledge and expertise restricted by organisational structures and departmental and geographical

boundaries to herald the emergence of a learning organisation, greater than the sum of its parts. It's about crowdsourcing, engagement, empowerment, recognition, ownership and transformation for learning and value creation.

This study examines the diffusion and utilisation of social media from both theoretical and empirical perspectives. The paper commences by reviewing pertinent literature in this field. It then presents a case study on the successful diffusion and utilisation of social media in an organisation. Success drivers are then discussed, followed by the contributions and significance of this study. The paper concludes with a review of limitations and suggestions for future research.

LITERATURE REVIEW

Social media have been popularly used for building online communities and connecting people by providing common online spaces and functionality for people to interact with each other, for example via blogging, discussion groups, file sharing spaces, and chat rooms (Bennett et al. 2009). Research on social media has been conducted across several disciplines, including psychology and behavioural sciences, marketing, education, public relations, and more recently in IS. A dominant focus of extant IS research investigates how social media are used for mass communication and for transforming societies in the 21st century in both public and private settings. This includes, for example, the impact of Wikileaks on mass social and political change and the effectiveness of Facebook in connecting millions of people across the globe. Consequently, early studies on social media have generally focused on non-work oriented environments because of the popularity of social networking sites, particularly among young generations, for connecting friends and families, such as Facebook, Friendster, CyWorld and MySpace (e.g. Ellison et al. 2007). In addition, some researchers examined how to incorporate social media in learning and teaching of the classroom environment (e.g. Kaufer et al. 2011; Ryan et al. 2011).

New research trends seem to be emerging in IS where social media are construed as central agents for mobilising knowledge and enabling collaborative innovation (Zhang 2010). For instance, Yates and Paquette (2010) studied the adoption of social media and its prospect in replacing traditional knowledge sharing and collaborative models based on personal presence (e.g. face-to-face meetings) in the emergency management of the 2010 Haitian earthquake. More recent studies have also been conducted in the public sector on the use of social media as political tools in campaigning, public relations, and government transparency (e.g. Bennett et al. 2009; Bertot et al. 2010; Smith 2010).

While such research provided an important foundation for understanding the multifaceted roles that social media could play in society at large, the implications of social media on communication and collaboration in the work environment require further investigation. Recently, several multinational companies have adopted social media with an attempt to enhance communication and collaboration among employees within their organisations (Wu and Millen 2010). However, the implications of adopting social media in the workplace context are yet to be adequately examined (Bennett et al. 2009), with only a limited number of exploratory studies addressing this emerging area. For instance, a study by Wu and Millen (2010) analysed employee behaviour on a UK company-internal social network site to determine the interaction patterns among colleagues. They found that organisations hosting social media sites might benefit from obtaining more information about workplace relationships among employees. Nevertheless, while some researchers (e.g. Culnan et al. 2010) recognise the importance of introducing social networks into the organisational domain in order to further enhance work-based communication and strengthen employee relationships, it is unfortunate that the business advantages and benefits of social networking in the workplace are still very much underappreciated and undervalued by many organisations (Bennett et al. 2009). Others argue that existing networks can themselves hinder the implementation of social networking sites (Zhang 2010).

Given such limitation, and in aiming to better understand the implications of social media in the workplace, this study explores the use of social media in an organisational context, to discern how and why social media are used. This investigation presents a case study on a regional branch of a leading multinational consultancy firm that is a pioneer in adopting social media for work collaboration. It identifies challenges and success factors relating to the use of social media in the workplace context. The following section presents the philosophical perspective adopted in this study.

RESEARCH METHDOLOGY

Given the exploratory nature of this research, an interpretivist research perspective is adopted incorporating qualitative research methods for data collection and analysis. Interpretive research assumes that: "People create and associate their own subjective and intersubjective meaning as they interact with the world around them. [T]he intent is to understand the deeper

structure of a phenomenon to increase understanding of the phenomenon within cultural and contextual situations" (Trauth, 2001, p.6). Walsham (1993, pp.4-5) also asserts that "interpretive methods of research in IS are aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context." This approach fits well with the purpose of this study as it aims to explore human thoughts and actions in a socio-organisational context, providing a deeper insight of why social media are adopted and used in orgnisations, or indeed for exploring any hindrances that may prevent or restrict this adoption. In such pursuit, a case study was identified, to represent a successful implementation and diffusion of social media in a workplace context. The authors came across the case serendipitously, through an ongoing connection with an industry partner. Anecdotally, the case seemed to present novel and innovative mechanisms for incorporating social media in an organisation, which the authors were compelled to investigate. Along with approval from the industry partner, the authors sought and attained ethics approval from their university (a mandatory approval for such empirical research) for collecting data, in order to ascertain that the research will not identify, or have any negative implications on the individuals who voluntarily chose to participate in the study. Once such approval was granted, in collaboration with the industry partner, an invitation email was sent to employees. The email included details of the project and its objectives, along with contact information for the researchers should any employee be interested in being interviewed. Several employees volunteered for the study. Another 'snowballing' data collection mechanism then emerged with employees recommending others for the study whom they thought would have a significant contribution to make due to their roles or involvement in social media. Empirical data from 10 interviews were collected in 2010. Given the offsite nature of the consultancy and audit work, it was challenging to find suitable time to meet for the interviews, but this was eventually accommodated to suit the interviewees and their time schedules. Along with the interview data, the interviewees often demonstrated the systems they used to the interviewers, which constituted a supplementary observation mechanism for data collection. The data were then transcribed, then coded and analysed with the assistance of QSR NVivo 9, a qualitative data analysis tool. The case study is presented next.

CASE STUDY

The organisation selected for the study is a regional branch of a leading multinational consultancy and audit firm with well over 100,000 staff globally. The organisation as a whole, and this regional branch in particular, have developed a reputation for being a leader in innovation. Given the nature of its work, many employees at the organisation spend considerable amounts of time at their clients' sites conducting their consultancy and audit work. This has prompted the organisation to consider various media for communication, where dispersed consultants can stay connected and collaborate on dealing with pressing issues whenever the need arises. In such context, collaborative technologies such as email and the office communicator, particularly for texting were primarily used for operational purposes among team members. However, with the mass proliferation of social networking in society at large, the organisation wanted to capitalize on its operational experience to achieve strategic and competitive objectives. Subsequently, social media, particularly including a proprietary social networking site for intraorganisation communication and collaboration were implemented. Such recognition was primarily driven by the strong championing of senior managers in the organisation as noted by one of the interviewees:

> *"One of the things we've got here that works really well is our CEO is very keen into… he's very keen on innovation, very keen on enabling things that promote culture and improve basically the overall workplace. But he has a lovely way of doing it. It really puts people at ease. […his approach is] very inclusive and welcoming. In fact, on [social media], quite early on, he joined up. So when it was happening, he got involved and he was having discussions with people. He loves it because he's able to get opinions from across the board. He's not just hearing from the same group of people all the time. So you can speak to the analyst and the directors and everyone."*

Social media were therefore reconceived as crowdsourcing mechanisms that could be utilised for eliciting the opinions of employees on a wide spectrum of organizational issues, as agents for creating an open and inclusive organisational culture, and as tools for unleashing innovation. Senior management wanted to transcend any simple operational use for routine transaction based communication among employees to achieve strategic objectives, where new sources of income are discoveres, and organisation wide cooperation ensues. This was particularly important for senior management, given the economic uncertainties emanating from the recent global financial crisis and from the strong competition in the marketplace. They anticipated that, by creating the optimal collaborative environment, the organisation will benefit from the innovative ideas generated, which could then be developed into new services and revenue streams. In demonstrating their unwavering

commitment towards such goal, management placed an optimistic goal for revenues generated from new innovations over a specified timeframe. One interview noted:

> *"obviously we may be on different floors, maybe out wherever we are, and then if you have a certain idea, good thing is if you did post something and then someone replies that you don't even know, but they're actually quite passionate and have similar ideas and you can easily connect with those people around and then network, things like that."*

Moreover, the use of social media contributed to flattening the organisation. Employees had the opportunity to, and were more comfortable in, communicating with their counterparts in other department, branches, and nations, and with their supervisors and senior managers. One of the managers interviewed noted the informality that the use of social media created:

> *"So it flattens the company structure. And one of the keys to making it work was that, early on [an employee placed a comment on social media] "I got to go to bed now. My 5-year old wants to use the laptop. Shush, don't tell [senior manager's name]." [The senior manager] came and saw and replied with, "It's okay. I won't." And that sort of joking release, it really made it okay for people to put things out there and to be themselves."*

In such context, social media became connecting mechanisms for people dispersed across geographical, departmental, and hierarchical boundaries. It assisted employees in establishing and nurturing relationships with their counterparts across the organisation. It even assisted in forming personal relationships with selected clients who were sometimes added to private or public systems, as an interviewee asserted:

> *"Well, the technology does enhance relationship or allows you to, because it allows you to collaborate more often and speak with others when otherwise you might be with different clients and things like that."*

Some of the innovations emanating from social media included replicating the social media success that this organisation has achieved for clients. The use of social media in itself, therefore, became a commercialized service that the organisation was planning sell, as proposed here:

> *"We can help clients do similar things now that we've got on board [social media] and that sort of idea. We could certainly see the benefits for nearly any client. So we're trying to sell those ideas and also in terms of policy use."*

Another example of innovation relates to carbon emissions accounting and reporting. At the time of the interviews the Australian government was attempting to introduce a carbon cap and trade system. In 2010, this was introduced, and is currently preceded by a carbon tax. Social media empowered employees to be proactive and take at the initiative in adapting to the new regulatory environment as noted by an interviewee:

> *"I've recently been involved somewhat in carbon emissions space for [this organisation]. I was putting in a reporting system for national reporting on our emissions. So I'm quite heavily involved in that, which is another project. And on that, I just posted a few things together some interest to see what people in [this orgaisation] were thinking about emissions […] So that starts, sparks a debate."*

Importantly, social media empowered employees to take ownership and to display initiative in creating an inclusive and innovative environment. One of the interviewees, who took the initiative to develop a group via social media noted:

> *"So I set up the [social media] group for us and then we kind of used that to collaborate and form ideas et cetera. So I think that's a pretty good tool because [employees in the organisation] have labeled me as the [social media] champion."*

Another interviewee was very happy to have provided advice to the CEO via social media and proud to be recognized by the CEO:

> *"The CEO put a question saying "I'm giving a speech on social media to 150 CEOs and directors. What are some interesting, ground breaking things that I could say?" Actually, nobody responded […] So I gave him some social media stats which I knew from one of these blogs. And then he immediately replied, "Oh, thank you [employee name] for that reply." I actually took a screenshot of that and saved it. It's the CEO thanking me!"*

This also demonstrates the flattening of the organisation, as all employees from junior graduates to the CEO have common grounds to communicate and collaborate, in an environment where such collaboration is promoted and encouraged. This also provided employees with means to attain recognition in a large organisation, and where they could take ownership of their ideas and innovations. This was succinctly expressed by an interview as:

> *"It's kind of good. Not only people see and know your name but also it's a good way for collaborating."*

DISCUSSION: SUCCESS DRIVERS

The case study demonstrates that championing is an essential element in effective diffusion and value adding utilisation of social media in an orgaisation. The role played by the regional CEO in promoting both social (e.g. commenting on casual discussion) and business (e.g. feedback on innovation) interaction among employees in the organisation was viewed by the interviewees as an essential motivating drive for their ongoing involvement in using workplace social media platforms. This created a collaborative environment where it was easy to connect to the collective knowledge in the organization as noted by an interviewee:

> *"[When the] CEO or a manager… someone high up, used [social media] and asked the question, I think like, 10 or 20 people responded within like a day and he was really happy that he had such power in [getting feedback] that people responded quite quickly."*

Furthermore, allowing for the use of social media for both social as well as commercial purposes is important for the effective diffusion of social media in organisations. It promoted the transition of the habitual use of community based social media into the organisation in order to create business value. It also encouraged an increased frequency of accessing the social media, therefore improving their utilisation. In this organisation, employees would post pictures, comment on the status of one another, as well as propose new ideas, and follow the posts of other employees, hence bridging the social and the organisational to create a dual purpose environment for interaction and innovation. The casual perspective that people often adopt when using social media also contributed to substituting the formality of organisational bureaucracy with the free flowing creativity of social networking expressed as:

> *"it's a balance between work related yet a bit more on the fun side."*

Moreover, recognition and ownership played a fundamental role in enticing employees to participate in organisational social media initiatives. In the past, innovative ideas would have to levitate through the bureaucratic chain of command. The innovators would lose track of the progress of their proposal, while their superiors attempt to 'sell' an idea that may still be vague in their minds to other departmental leaders, who could then percolate it to their subordinates. In such process, the original proposal may be misunderstood or watered down, particularly given its dissociation with the person who proposed it. Another inherent disincentive is the fear that the idea, if successful, will be claimed by others, and the proposer will get little recognition if at all. In such context, the use of social media created an incentive to innovate, as the proposer of a new idea is identified and encouraged to take ownership and responsibility in advocating and defending their proposal. Moreover, if any negative feedback is received, such feedback is balanced against positive feedback that the idea may also attract, which could lead to the innovation being fine-tuned rather than dismissed altogether.

Within this contribution rich environment, it was essential to establish a formal autonomous multidisciplinary team - with seed funding - to identify and pursue promising ideas for development and commercialisation. Such team could incorporate dedicated staff as well as various members from different departments to assist in the evaluation and further development of

new ideas. The availability of seed funding at the disposal of the team improved the team's efficiency in accelerating promising ideas towards innovations that could be commercialised, hence reducing any lost opportunity cost and boosting market competitiveness and adaptability. An interview explained this process as follows:

> *"We won some awards for our sort of innovation [...]. We also have an innovation zone which is a portal. It's quite often that after they have a [social media] conversation, they'll go into the innovation zone and put up an official idea. It's somewhere where you can log official sort of ideas where you got somewhat of a business case behind. But quite often, our innovation council will look at that [on social media] if it's something that attracts a lot of interest or something they see. They'll look at it, you know, they'll ask you to put a proper business case together and then from there, they may allocate funding to actually see if you can make it become a reality."*

Associating an organisational revenue target with the use of social media for innovation also played a critical role in promoting creativity. It presented a tangible example of the values that form and transform organisational culture. For employees, it demonstrated that their ideas count, that they are part of a collective community, and that organisational success is not merely a by-product of their functional accomplishment but also their organisation-wide intellectual creativity and contribution. The revenue target proposed by this organisation is not only measurable but also optimistic and empowering as it promotes the values that the organisation wishes to uphold and nurture.

Furthermore, the use of hybrid, proprietary and public web-based systems, promoted the use of social media for business value creation in the organisation. Restricting communications to a single system seems to play a negative role in their proliferation for business purposes. Allowing for the use of public web-based systems to compliment organisational proprietary systems assisted the organisation in exploiting extra functionality that it lacked in its system, while promoting an open environment of free networking and knowledge sharing.

CONTRIBUTION AND SIGNIFICANCE

This exploratory study holds interesting theoretical and practical implications. At a theoretical level, the study presents several dimensions that influenced the successful diffusion of social media in an organisation. It provides an important empirical investigation of issues influencing the successful diffusion of social media in the workplace. These issues may be of relevance to researchers in this field, who may wish to further investigate and expand upon these findings.

From a practical perspective, the study could be of significance to organisational leaders and managers, who are interested in transforming their organisations to become more innovative, flexible, and adaptive. The study highlights to prospective adopters the importance of strategic championing of social media in organisations, as well as the critical role that strategic planning plays through the formalisation and quantification of some of the benefits the firm anticipates to generate thought social media, for instance, revenue targets that could be reviewed and assessed over time. The empowering influence of social media also presents a further incentive for organisational leaders to consider, in their quest for value creation and competitiveness.

LIMITATIONS AND FUTURE RESEARCH

As with all research studies, this paper has several limitations. This exploratory study was limited to employees who volunteered to be interviewed. All those volunteers had an active engagement with, and positive attitude towards, social medial in their organisational context. It is likely that others in the organisation may indeed have reservation and/or negative attitudes towards social media, and hence may have chosen not to volunteer for this study. Moreover, the study was conducted in a single branch of a single organisation. It is likely that views in other branches and other organisations, particularly organisation operating in different industries (e.g. manufacturing or construction) and in different socio-cultural contexts (e.g. where social hierarchy and social presence are viewed as essential), may differ. Such difference may be most pronounced in milieus where English, the de-facto language for most social media, is not spoken or used for business purposes.

This prompts the consideration of several research avenues. It will be interesting for future research to contrast this case on successful diffusion of social media, with cases on failure. This will provide for an interesting exploration and comparision that will enrich our understanding of both motivators and hindrances for the diffusion of social media in organisations. Future research may also consider the influence of national culture and organisational culture on the diffusion of social media. This

could include organisations operating in non-English speaking contexts. Organisations operating in multiple industries may also be considered. Studies on the transformative agency of social media would also bring an interesting perspective in relation to the openness, accountability, transparency, and value creation achieved through such systems. This may also highlight the evolving role of the IT/IS professional as an organisational thought leader and innovation enabler, beyond what has been the traditional confines of technical proficiency. Demographical issues and their effect on the diffusion of social media may also provide for an important empirical insight into the diffusion of social media in organisations. Research in this field holds great potential for both theory and practice and may indeed provide an important impetuous for driving inclusive innovation in organisations.

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EXHIBIT 10

OUR CLUSTER MODEL

Visionary and First Mover in Developing Urban Life Science, Technology, and AgTech Clusters

Founded on the belief that innovative companies are most successful when positioned in the epicenter of the world's top life science and technology ecosystems—in close proximity to world-renowned **academic institutions**, leading **scientific and managerial talent**, and sophisticated **investment capital**—Alexandria applies Harvard Business Professor Michael E. Porter's cluster theory as a critical element of our unique and differentiated business model.

"Clusters are geographic concentrations of interconnected companies and institutions in a particular field. ... clusters affect competition in three broad ways:

FIRST, ***by increasing the productivity of companies based in the area;***

SECOND, ***by driving the direction and pace of innovation, which underpins future productivity growth; and***

THIRD, ***by stimulating the formation of new businesses, which expands and strengthens the cluster itself."***

MICHAEL E. PORTER
Bishop William Lawrence University Professor
Harvard Business School
1998

Big Bets on Cluster Development

Alexandria foresaw today's **trend of urbanization** to foster innovation and collaboration, and we made the crucial early decisions to pursue our **urban cluster campus strategy** as the first mover in Mission Bay (2004), New York City (2005), and Cambridge (2006).

These big bets catalyzed our unique focus on collaborative life science and technology campuses that enable and inspire the world's most brilliant minds to develop life-changing breakthroughs in our AAA innovation cluster locations.

ABOUT ALEXANDRIA

Building the Future of Life-Changing Innovation™

Our Mission

To create clusters that ignite and accelerate the world's leading innovators in their noble pursuit of advancing human health by curing disease and improving nutrition

THAT'S WHAT'S IN OUR DNA™

The Alexandria Story

Alexandria began as a garage startup with a vision to create a new kind of real estate company uniquely focused on serving the life science industry.

We named the company after Alexandria, Egypt, the scientific capital of the ancient world, renowned for its iconic lighthouse whose beacon today still evokes the noble pursuit of scientific advancement and revolutionary discoveries.

Over the last 25 years, we have established ourselves as the leader in owning, operating, and developing collaborative and dynamic life science, technology, and agtech campuses in key urban innovation cluster locations.

First Mover in Developing Urban Life Science, Technology, and AgTech Clusters

Alexandria was founded on the belief that four ingredients are essential to creating world-class life science, technology, and agtech clusters where innovative companies can thrive and succeed: **LOCATION** + **INNOVATION** + **TALENT** + **CAPITAL**.

Our cluster model unites cutting-edge science and technology with leading scientific and managerial talent and strategic investment capital in best-in-class locations immediately adjacent to the world's top academic institutions.

Our Verticals

The Alexandria Advantage®

REAL ESTATE
We own, operate, and develop collaborative life science, technology, and agtech campuses in the top urban innovation clusters in North America.

CORPORATE RESPONSIBILITY
We are dedicated to making lasting, positive change in the communities in which we live and work through sustainability, philanthropy, and volunteerism.

THOUGHT LEADERSHIP
We convene our world-class global network for unique and interactive programming, including the Alexandria Summit®, to create opportunities that will shape the future of healthcare.

VENTURE INVESTMENTS
We provide investment capital to innovative life science and technology entities through Alexandria Venture Investments, our strategic venture capital arm.

Operational Excellence

Our dedicated, first-in-class team's consistent and effective execution of our differentiated business model, combined with its deep expertise and industry relationships, continues to drive strong performance:

- **S&P 500® investment-grade REIT**: Moody's: Baa1 / Stable; S&P Global: BBB+ / Stable
- **REIT-industry leading tenant roster**: Consists of high-quality, diverse, and innovative companies
- **Stable and focused platform of internal and external growth**: Delivers higher occupancy levels, longer lease terms, higher rental income, higher returns, and greater long-term asset value

Business Strategist Testimonial

"Alexandria has achieved the three outputs that define a great company: **Superior Results**, **Distinctive Impact**, and **Lasting Endurance**."

JIM COLLINS
Renowned Author &
Business Strategist

CAREERS

Join Our Mission-Driven Team

Our team is family and at the center of all we do. We're looking for entrepreneurial and genuine individuals to join us in pursuit of **our mission to enable the world's leading innovators in their efforts to advance human health**. Our dedicated and talented team members work and collaborate across a range of functions, including:

- Accounting
- Finance
- Science & Technology
- Asset Management
- Leasing
- Strategic Programming & Philanthropy
- Real Estate Development
- Sustainability
- Laboratory Operations
- Communications & Design
- Talent Management & Operations
- Information Technology
- Legal

View current opportunities

Our Culture & Community

At Alexandria, integrity, respect, humility, and drive are woven into our DNA. We strive to remain agile as our company evolves; to cultivate a culture of excellence defined by our sense of purpose; and to seek opportunities to grow, collaborate, and be inspired.

Since our inception, we have been deeply committed to improving the health and vitality of our local communities and our world. Through our philanthropy and volunteer program, Operation C**ARE**, we provide time, resources, and financial support to impactful non-profit organizations doing critical work in medical research, STEM education, military support services, and local communities.

Benefits

We devote extraordinary efforts to hiring, developing, and retaining our talented employees, and we understand firsthand that the health, happiness, and well-being of our team are important to their success. Our industry-leading and comprehensive benefits package includes:

- 100% company-paid premiums (top-tier health, dental, and vision plan for you and your family)
- Generous 401(k) profit sharing plan
- Ample paid vacation, sick, and holiday time
- Paid parental leave

- Generous rewards and recognitions
- Charitable gift matching
- Annual paid time off for volunteering
- Wellness and fitness incentives
- Life insurance, disability plans, and an Employee Assistance Program

Grow Your Career at Alexandria

Continued learning and flexibility are imperative to the success of our business. We foster an enthusiasm and curiosity about learning and provide you with access to a wide variety of offerings and resources to support your career growth, including:

- In-person trainings on leadership, communication, project management, etc.
- Mentoring
- Coaching
- Career guidance
- On-demand learning resources
- A personalized on-boarding experience

Inclusion & Diversity

We recognize we are better together. We have created an environment where people of diverse backgrounds and perspectives can bring all of who they are to work. We believe in treating every single person equally and with respect and dignity. It is not just something we do, it is at the core of who we are.

Our Locations

PASADENA, CA

SAN DIEGO, CA

SAN FRANCISCO, CA

SEATTLE, WA

CAMBRIDGE, MA

NEW YORK, NY

SEARCH FOR JOB OPPORTUNITIES

GAITHERSBURG, MD

RESEARCH TRIANGLE PARK, NC