

Responsible Innovation: Moving Towards a Culturally Sensitive Approach

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Abstract

Responsible Innovation (RI) recently emerged as an approach that addresses issues related to major social and environmental risks and uncertainties in complex innovations. At this stage, more inquiry is still needed to make the Western-rooted RI approach more contextual and to facilitate its applicability in practice, especially in other cultural settings. To address this issue, we propose a conceptual framework based on Hofstede's dimensions of national culture and core processes of RI. We argue that the cultural dimensions are likely to play distinct roles in influencing how these RI processes would be interpreted and operationalised in different societies with different cultures, illustrating this with some examples from Asian countries. Ultimately, the paper emphasises the importance of evolving a broader, more comprehensive and mature approach to RI that takes cultural aspects explicitly into account.

Keywords: responsible Innovation, culture, Hofstede's cultural dimensions, contextualisation, culture-sensitive operationalisation, Asia

Highlights

- The study explores how Responsible Innovation (RI) can be operationalised in different cultural contexts.
- A framework is developed that links Hofstede's societal cultural dimensions with dimensions of RI.
- Many culture-specific influences on RI dimensions are identified.
- Cultural attuning of RI's conduct can improve effectiveness and avoid averse outcomes

1. Introduction

Responsible Innovation (RI) is a concept coined in science and technology fields, particularly in technology assessment (e.g., Guston and Sarewitz, 2002; Hellström, 2003; Schot and Rip, 1997). It stresses that responsibility should be a prerequisite for innovation and a central focus in all stages of the innovation process. The major reason for this is that complex innovations can have undesired negative impacts ones, especially in relation to social and environmental sustainability (Setiawan and Singh, 2015; Stilgoe et al., 2013).

Various interpretations of RI have proliferated in the literature (e.g., Hellström, 2003; Owen and Goldberg, 2010; Setiawan and Singh, 2015; Singh and Kroesen, 2012; Stilgoe et al., 2013; Sutcliffe, 2011; von Schomberg, 2012). Authors have identified different process dimensions as the constitutive elements of RI or important aspects for guiding innovation activity. For example, Stilgoe et al. (2013) single out anticipation, responsiveness, reflexivity, and inclusion, while Setiawan and Singh (2015) flag anticipation, responsiveness, reflexivity, deliberation and participation.

However, the application of RI can be still problematic in practice as it lacks comprehensiveness and specificity with regard to the links between innovation and the norms and values of the society in which it is supposed to take place.

In this paper, we refer to these society-specific norms and values as cultural aspects. Culture can be reflected in societal goals and goals of innovation in society, as well as in norms about how innovation processes are conducted and shaped. Many studies suggest that societal culture is an important determinant of innovation (e.g., Ahmed, 1998; Hofstede, Hofstede, and Minkov, 2010; Kaasa and Vadi, 2010; Shane, 1993; Shane, 1992; Ulijn and Weggeman, 2001; Westwood and Low, 2003). These studies reflect that culture and associated values matter, implying that what is valued and appreciated, or disliked, by certain societies should be deemed to be a pivotal basis for understanding and practising RI. From this perspective, the above-mentioned process dimensions of RI could be interpreted differently depending on societies' cultural features; therefore, their operationalisation could pose different requirements. For instance, broad participation by different stakeholders in a plenary deliberation forum fits well with liberal democratic values typical of Western societies, but one cannot assume that it would be a suitable way to engage and empower project stakeholders in certain Asian societies with strong hierarchical social relations. Since RI has predominantly evolved from European and North American research and innovation practice (Macnaghten et al., 2014) and therefore implicitly embodies a Western cultural value set, it should be challenged and further developed with respect to its broader cultural applicability (Fisher, 2016; Lukovics, Flipse, and Udvari, 2017; Wong, 2016). Yet, RI literature hardly addresses the role of national culture and cultural value differences in the operationalisation of RI dimensions. (note 1)

Achieving a deeper understanding of RI and its relation to societal cultural aspects is therefore fundamental to evolving a broader, more comprehensive RI approach that is versatile enough for use in different cultural settings. In this regard, this paper has two objectives. The first is to contribute to developing a deeper understanding of RI in relation to societal cultural context. For this, we review the RI literature to pinpoint starting points for elaborating cultural aspects and then review the literature that focuses on the role of national/societal culture as an important element of innovation. The second objective is to use the key findings from these reviews for the development of a conceptual framework that can be used to investigate the relationship between culture and RI dimensions. The framework is designed to explore how cultural specificities could influence the interpretation and operationalisation of RI dimensions, and how such interpretation and operationalisation may affect the process of shaping and creating knowledge or innovation. This will facilitate the applicability of the RI approach in different cultural settings. We use some illustrations from Asian countries to show concrete areas of applicability.

2. Responsible Innovation

Over the last decade, RI has increasingly gained attention as a compelling approach to scientific research and innovation, notably in Europe and North America. RI views responsibility as the central theme of science and innovation practice (Stilgoe et al., 2013), proposing the importance of institutionalising anticipatory and reflexive governance mechanisms for new and emerging technologies. For example, in the USA, RI sprung up in the context of discussions about the unforeseen impacts of nanotechnology development. In Europe, RI emerged in response to strong public rejection of controversial biotechnologies such as genetically modified organisms (Vasen, 2015).

Another notable reason for the emergence of RI is the growing complexity of the socio-technical and socio-ecological systems in which innovation takes place; this may also increase vulnerability and the risk of systemic failure. Dealing with the unpredictability of innovation in an increasingly complex environment demands collective responsibility of research and innovation actors (Grinbaum and Groves, 2013). Therefore, from the RI perspective, actors should be held responsible for the negative impacts of research and innovation in terms of economy, environment and society from the very beginning and throughout the research and innovation process.

RI attempts to make interventions in the real world—being closer to social practice and taking into account various actors' potential to influence actions and decisions in their respective fields (Grunwald, 2014). Compared with earlier reflexive innovation approaches such as Technology Foresight and Constructive Technology Assessment (see, e.g., Linstone, 2011; Köhler and Som, 2014) it comes with a new emphasis on ethical reflection as a shaping force in innovation, to align innovation with social values in better ways. This is illustrated by the various definitions of RI found in the literature.

Von Schomberg (2012) defines RI as a transparent and interactive process involving societal actors and innovators in a mutually responsive way with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its products. This definition reflects three specific aspects of responsibility: environmental, societal and ethical. The environmental aspect considers sustainability as the key principle of innovation policy and regulation. The societal aspect is about how to strike a balance between the advantages and disadvantages of innovation to social life, both from an intra-generational and inter-generational perspective. In combination with the

environmental aspect, this appears to align with the Brundtland definition of sustainable development. The social aspect also partly overlaps with the ethical aspect, which is grounded in the core values held by a society and which reflects the motivation of societies to achieve certain needs. Ethical values can differ between societies, for instance in accordance with their level of socio-economic development (Blaskó et al., 2014). In line with Maslow's hierarchy of needs (Maslow, 1970), in less-developed areas, the pursuit of research and innovation for satisfying immediate material basic needs could be considered more important than paying attention to self-realisation and popular democracy. Then, the ethical responsibility surrounding innovation should concern how the satisfaction of prioritised specific needs or interests of societies can be assured. Not surprisingly, the ethical dimension is regarded as the most controversial aspect of RI (Blaskó et al., 2014; Schomberg, 2013). Owen et al. (2013, 36) propose a relatively broad definition of RI: "...a collective commitment of care for the future through responsive stewardship of science and innovation in the present". A more detailed working definition of RI by Singh and Kroesen (2012, 36) is:

...being caring or ensuring care for certain values for social, economic and environmental sustainability by engaging in anticipation, reflexivity, deliberation, responsiveness and participation for bringing up any change in any idea, product, process, method, way of doing business, technology, et cetera, in order to bring them into a specific market or use them in a society.

This distinguishes between, on the one hand, the goals of RI, and on the other hand, the process of RI through which to ensure the embedding of certain values to achieve those goals. The goals are societal, economic and environmental sustainability. The process is ensuring the accountability of actors through their engagement in anticipation, reflexivity, deliberation, responsiveness, and participation (see also Setiawan and Singh, 2015). Further, the definition suggests that by being sensitive to or considerate about certain values, either universal ones or culturally specific ones, actors will create innovations that are socially, economically, and environmentally sustainable. Actors have to appreciate values, including value differences across actors and contexts, for achieving a satisfactory outcome. This is guided by the five dimensions, which act as the so-called guiding mechanisms of RI.

Unlike Owen et al. (2013) and Stilgoe et al. (2013), Singh and Kroesen (2012) and Setiawan and Singh (2015) split inclusion into participation and deliberation in recognition of their unique features, while also acknowledging their complementary roles for ensuring a responsible innovation process (the participation of stakeholders should be inclusive, while true deliberation requires inclusive participation of stakeholders). We will follow this distinction in this paper.

All RI dimensions are equally important in the sense that they should all be present and work in synergy to make a RI process work well. There are different ways in which such synergy can be established. The actions based on the different dimensions could be performed in an iterative or lateral fashion, depending on the nature of the innovation, requirements of the situation, and stakeholders involved.

Synthesising the different classifications of RI dimensions introduced earlier, the following five will be used in this paper:

- 1) *Anticipation* refers to innovation actors or stakeholders trying to foresee and plan for the possible undesirable outcomes and consequences of an innovation. It also means acting to overcome the expected challenges beforehand, be they environmental, social or economic (Blaskó et al., 2014). Anticipation prompts the questions of "what if..." and "what else might it do?" (Owen et al., 2013).
- 2) *Reflexivity* refers to a circular or iterative process of creating and shaping innovation by stakeholders. It emphasises the process of learning from accumulated experience in order to understand the feedback mechanisms or the cause-effect relationships of innovation processes. It also means reflecting on the underlying purposes, potential impacts and motivations of innovation (Owen et al., 2013) as the basis for exploring and assessing the causes and effects of innovation and the desirability of going ahead (Blaskó et al., 2014).
- 3) *Deliberation* refers to a thorough exploration process by innovation actors or stakeholders, conveying a careful consideration of divergent aspects, which involves in-depth discussions in order to reach an agreement about the way forward. Deliberation entails open and meaningful exchange during sustained interaction from the beginning of innovation processes (Jasanoff, 2003; Parkhill et al., 2013). Being deliberative means inclusively opening up visions, purposes, questions and dilemmas through dialogue, engagement and taking into account stakeholder and public perspectives (Blaskó et al., 2014; Singh and Kroesen, 2012).
- 4) *Responsiveness* is about innovation actors or stakeholders readily responding to or addressing certain

circumstances due to different requirements, needs, views, issues and values. Being responsive means using the collective process of reflexivity and deliberation outcomes to adjust and influence the course and pace of innovation in an adaptive way (Blaskó, et al., 2014; Pellizzoni, 2004). Therefore, responsiveness demands the ability to respond to changes and the emergence of new knowledge (Stilgoe et al., 2013).

- 5) *Participation* refers to different stakeholders being involved in a process. It addresses stakeholder interests in the issues and recognises the value of their specific knowledge and opinions, which makes their involvement a key characteristic of, or a major condition for RI (Koops, 2015; Owen et al., 2013; Singh and Kroesen, 2012; Schomberg, 2013).

RI is still an evolving research and action field, which leaves ample room for improvement. For example, Vasen (2017) suggests that the approach should be more responsive to issues related to other geographical contexts, such as cultural acceptance, and how the focus can go beyond emerging technologies. Alluding to similar issues, de Jong et al. (2015) argue that RI should be applied as a guiding approach within the specific societal context or culture where it is used. However, the role of societal culture and acknowledgement of cultural value differences are apparently still missing in the aforementioned RI definitions. We notice in particular that the discussion about RI lacks comprehensiveness and does not consider the links between innovation and cultural aspects or value differences. Culture can be reflected in societal goals and goals of innovation in society, as well as how innovation processes can be conducted and knowledge created. What is considered to be effective, good and legitimate in one society could be considered doubtful or off-limits in another. This is why it is important to understand the role of societal culture in innovation as the starting point to understanding RI in relation to cultural context.

3. Culture and Innovation

Many studies suggest that innovation requires specific conditions, and culture is considered an important factor (Ahmed, 1998; Kaasa and Vadi, 2008; Shane, 1993; Shane, 1992; Ulijn and Weggeman, 2001; Westwood and Low, 2003). Westwood and Low (2003) conclude that the culture-innovation relationship is complex, reflexive and not universal. Shane (1993) finds that individualistic, non-hierarchical, and uncertainty-accepting societies have a higher national rate of innovation than other societies. These findings are supported by Kaasa and Vadi (2008) whose observations suggest that culture can contribute or hinder the process of developing and implementing new ideas or innovation. Ahmed (1998) argues that certain cultural norms, such as trust and openness, awarding and rewarding, autonomy and flexibility, are also needed to facilitate an innovative climate. Tushman and O'Reilly (1997) find that culture is one of the most important factors in the management of innovation. Culture can also affect the direction of innovation, in that it shapes the pattern dealing with novelty, individual initiatives and collective actions, and understandings and behaviour regarding risks as well as opportunities (Kaasa and Vadi, 2008).

The term culture is, of course, multi-discursive, having been defined in a variety of ways by many scholars (e.g., Allaire and Firsirotu, 1984; Hofstede, 1980; Hofstede et al., 2010; Schwartz, 1994; Smith et al., 2002; Taylor, 1871; Trompenaars, 1993). Buono et al. (1985) note that most definitions of culture used currently in the social sciences are modifications based on the concept of culture by Taylor (1871, 1): “that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society”. Some scholars conceptualise culture as the shared meanings assigned by society members to things and people within the community (Smith et al., 2002). Kroeber and Kluckhohn (1952) (quoted in Veiga et al., 2001, 146) elucidate that culture consists of “*patterns*, explicit and implicit of and for behaviour, ... [that] may, on the one hand, be considered as *products of action*, [and] on the other, as *conditioning elements of future action*”. Westwood and Low (2003) observe that in its broadest sense culture has been represented dominantly in terms of shared values. Hofstede (1980, 21-23) defines culture as “the collective programming of the mind which distinguishes the members of one group from another”. Kaasa and Vadi (2008) explicate that culture has a two-fold function: it holds society together and assists individual decision-making and making sense of reality.

Culture scholars have come up with various classifications of cultural dimensions that capture different shared values in societies or nations. For instance, Hofstede (1980) distinguishes four cultural dimensions: power distance, uncertainty avoidance, individualism/collectivism, and masculinity/femininity. In a later study, Hofstede et al. (2010) add ‘long-term orientation’ as a fifth dimension. Trompenaars (1993) identifies seven national cultural dimensions for understanding diversity in the global environment: universalism/pluralism, individualism/communitarianism, specificity/diffuseness, affectivity/neutrality, inner-directedness/outer-directedness, orientation towards achieved-status/ascribed-status, sequential/synchronic focus, and past-orientation/future-orientation. Hofstede’s dimensions have been particularly widely used to study the influence of societal culture on innovation (Hofstede,

2001; Kaasa and Vadi, 2008; Lynn and Gelb, 1996; Png, Tan, and Wee, 2001; Steenkamp, ter Hofstede and Wedel, 1999; Yaveroglu and Donthu, 2002). His five dimensions touch upon fundamental issues in cultural behaviour of people within organisations and institutions and have been validated by research across many nations. Hofstede's five dimensions, as used in this paper, are as follows (Hofstede et al., 2010):

- 1) *Power distance (PD)*. The degree to which members of a society accept that power in organisations and institutions is unequally distributed. It expresses to what extent power structure and hierarchical relations are considered important and legitimate in the given society.
- 2) *Uncertainty avoidance (UA)*. The way in which members of a society respond to uncertainty and ambiguity. It depicts how certain societies support beliefs that ensure certainty and maintain the rules that protect conformity.
- 3) *Individualism/collectivism (IDV/COL)*. The degree to which members of a society value the preferences and interests of an individual versus those of a group.
- 4) *Long/short-term orientation (LTO/STO)*. The extent to which members of a society show propensity to deal with current and future challenges.
- 5) *Masculine/feminine orientation (MO/FO)*. The extent to which a society appreciates stereotypically 'male' qualities like assertiveness, toughness, and focus on goals and material success, versus stereotypically 'female' qualities including modesty, tenderness and nurturing, process orientation, emphasis on consensus-seeking, and concern with quality of life instead of economic wellbeing in a narrow sense.

Steers et al. (1996) point out that "no nation or culture has a monopoly on the best ways of doing something". This is especially so when it comes to the operationalisation of RI dimensions in different cultural settings. Therefore, it is reasonable to propose that the way RI dimensions are understood and conducted has to fit in with local norms and values.

4. Towards a Culture-Sensitive Conceptual Framework for the Application of RI

So far, there has been no explicit research on the link between cultural factors and the dimensions of RI. Yet, as this section will show, research on the effects of culture on innovation, technology, organisation, etc., offers perspectives on such a link. Societies may interpret and operationalise RI dimensions in different ways, according to their national culture. Drawing on the theories and approaches reviewed in the previous sections, the conceptual framework here is designed to explore how societal cultural specificities could influence the operationalisation of RI dimensions. The framework is based on the five cultural dimensions of Hofstede et al. (2010) and the five dimensions of RI enumerated by Setiawan and Singh (2015).

One way to arrive at indicative influences of culture on RI dimensions is by drawing upon particular literature that explains how cultural attributes influence societal behaviour. These strands of literature are synthesised to highlight findings that provide insights about likely relationships between each culture dimension and each RI dimension. The findings are then transcribed into a set of indicative influences that can be viewed as plausible hypotheses. In a few cases where provisional influences could not be formulated due to lack of relevant literature, propositions are advanced on the basis of the authors' own insights and ideas. All indicative influences and their relevant source(s) of information have been compiled in Table 1.

Power Distance (PD) reflects the degree to which members of a society accept that power in organisations and institutions is unequally distributed. It is related to managing authority. High PD indicates that power structure and hierarchical relations are considered important in the given society, characterised by the extensive use of formal rules and centralised authority (Karwowski, 2006). Many Asian societies are characterised by high PD. In low PD societies, the decision structure is often more decentralised, with fewer prominent chains of command and more informal, direct and participative communication. Van Everdingen and Waarts (2003) find that in a society with high PD, hierarchical structure often hinders the process of information sharing and limits the participation of the members. This is effective for innovation processes that require tight centralised orchestration, while it could be problematic when innovation requires extensive exploration with significant openness to information from different actors and sources. In contrast, in low PD societies the decision structure is often more decentralised, with fewer prominent chains of command and more informal, direct and participative communication. Communication across hierarchical structures is commonly found (Shane, 1993; Williams and McGuire, 2005). This creates more opportunity for forming collaborations, sharing ideas and new knowledge, which can be conducive to creative

interactive innovation that requires looking beyond established boundaries. Lane et al. (2006) also find that in high PD cultures people are less likely to speak up or disagree with their superiors, which may hamper team reflexivity and group learning. Herbig and Dunphy (1998) find that in societies with high PD, creative activities are often hampered by bureaucracy and people tend to be more fatalistic and reluctant to respond to changes, hence they have less incentive to innovate and to think about what should be anticipated beforehand. Rigid bureaucracy and too many formalities also make people less productive in thinking creatively (Shane, 1992). In low PD societies, people tend to display more creativity since there is more trust between hierarchical levels (Kaasa and Vadi, 2008). This is supported by Lane et al. (2006), who find that deliberative discussion and reflexive group thinking are most likely to occur in cultures with relatively low PD.

Uncertainty avoidance (UA) refers to how members of a society treat uncertainty and ambiguity. It depicts how certain societies support beliefs that ensure certainty and maintain the rules that protect conformity and stability. Hofstede sums up UA as a conviction that “what is different is dangerous”. Working relations rules are carefully followed in societies characterised by high UA. People prefer to seek consensus and affirmation. They tend to be more resistant to innovation because it brings some kind of change and uncertainty (Shane, 1993; Everdingen and Waarts, 2003). Uncertainty-averse attitudes may lead to rejection of a novel idea (Kaasa and Vadi, 2008). Furrer et al. (2000), too, indicate that people in high UA cultures are more cautious about new ideas and tend to avoid risks and impacts associated with such ideas. Such attitudes also tend to make people reluctant and slow to respond to certain changes (Furrer et al., 2000).

In contrast, societies with low UA cultures are typically more open to new things and respond more quickly to new ideas (Furrer et al., 2000; Leidner and Kayworth, 2011). People regard conflicts as a constructive aspect of life and, to some extent they violate organisational rules for pragmatic reasons. They tend to be inclined to take risks. According to Hofstede, cultures with low UA prefer an independent decision-making process where individuals are not so much involved, while the high UA cultures prefer consultative decision-making as a way to seek consensus. Low UA cultures tend not to experience anxiety related to inability to accurately foresee all future factors that might be relevant to a decision (Hofstede, 1993; Leidner and Kayworth, 2011). This also helps to explain why comparatively more longer-term planning is typically undertaken in high UA cultures (Hofstede, 1993; Leidner and Kayworth, 2011). This suggests that high UA societies would typically encourage the use of extensive data analysis before making decisions, while in low UA cultures people may not trust data and view it with great scepticism in relation to foreseeing the future (Leidner and Kayworth, 2011). The common approach often found in low UA cultures is that decisions are made without critical analysis and by just assuming that all will be accomplished in time (Hofstede, 1993; Leidner and Kayworth, 2011; Moran and Abbot, 1994). Correspondingly, Kras (1995) finds that in low UA cultures, people tend to be less deliberative in dealing with certain issues or changes, and, being more tolerant of uncertainty, are less inclined to analyse data in detail.

Individualism/collectivism (IDV/COL) describes the degree to which members of a society value individual-versus-group interests. This dimension is related to managing relationships (Karwowski 2006). In individualistic societies, everyone is assumed to be responsible for taking care of himself/herself and his/her family members. People make their own choices and decide independently on the basis of argument and rationality. In contrast, collectivistic societies are characterised by strong relationships between individuals, collective decisions and community-based regulation. Individual actions are expected to conform to group norms. Thus, compared with individualistic societies, collectivistic societies prefer to avoid anything that might affect the social stability of communities (Chen et al., 1995; Smith, 2004). Collectivistic societies regard individual contributions as belonging to the organisation or community. They prefer to maintain harmony, can be more easily influenced by social cues and show least freedom to express individual opinions in a deliberation process (Min, 2009), compared with individualistic societies (Herbig and Dunphy, 1998). According to Min (2009), deliberation processes in individualistic cultures are characterised by equal participation, freedom to express opinions and reasoned argument in reaching consensus. This provides more opportunity for people to try something new and have more reasons to expect reward and recognition for their ideas (Shane, 1992; Everdingen and Waarts, 2003). The adoption of new ideas or innovation is also faster in individualistic cultures than in collectivistic cultures (Rikowski 2007).

Long/short-term orientation (LTO/STO) reflects the orientation of a society in its search for virtue. It also explains how societies maintain some links with their own past and prioritise their existential goals differently. Long-term-oriented cultures focus on the fostering of virtues related towards future rewards; they are concerned with future-oriented goals and encourage thrift and perseverance as the way to prepare for the future. Short-term-oriented cultures focus on fostering virtues related to the past and present; they are concerned with tradition-oriented goals, past and present achievements, norms, and fulfilment of social obligations. The most significant element of this

cultural dimension is how far ahead people envisage and prepare for the future (Hofstede et al., 2010). People in long-term-oriented cultures usually take a pragmatic approach, as they believe that truth depends very much on context, time, and situation (Hines et al., 2010). In contrast, societies with a short-term orientation prefer to take a more normative approach, value absolute truth and tend to view societal changes with suspicion (Hines et al., 2010). According to Hofstede, long-term-oriented cultures regard the relationships between members as ordered by status. In practical terms, this also suggests that the status of individuals matters when they involve themselves in something. In short-term oriented cultures, status is not regarded as a major issue in relationships; what is important is the bottom line of the issues. With respect to acceptance of change, long-term-oriented societies require belief in future payoff that justifies changes (Veiga et al., 2001). They anticipate risks associated with changes by taking long-term payoffs into account (Steenma et al., 2000). Societies with a short-term orientation tend to be more responsive to changes if a need exists, especially when the traditions or past success are shown to be wanting (Hofstede, 1993; Veiga, 2001 et al., 2001). Nakata and Sivakumar (1996) view long-term-orientation cultures as tending to promote new product development with an emphasis on future opportunities; short-term oriented cultures are more likely to be reluctant to get involved in the development of new products and emphasise retaining past successes and current achievements of the existing products.

Masculine/feminine orientation refers to the extent to which a society values material goal orientation and achievement and associated behaviours. Hofstede's masculinity/femininity dimension does not refer exclusively to gender issues but has certain gender implications. A high MO/FO society is seen as one that appreciates individualism, ambition, acquisition of wealth by people of both genders, and is generally characterised by distinct gender roles. A low MO/FO society is characterised as one that values caring and nurturing behaviour and social and environmental awareness. It has more fluid gender roles and less-pronounced gender inequality.

It follows that a society that scores high on Hofstede's MO/FO index shares many features that are typically associated with innovative entrepreneurship, especially its positive valuation of the striving towards high individual achievement, acceptance of risk-taking in pursuit of material gain, and admiration and celebration of material success. In a society with a low MO/FO score, overly competitive behaviour and material success could be frowned upon as being too self-centred and antisocial. Irrespective of gender, people in such settings are more concerned with the conduct of social processes. Social capital in their society is high. The quantity of innovation output might be less than in a high MO/FO society with fewer social constraints on individual entrepreneurial behaviour, but one could infer from the descriptions of the features characterising low MO/FO societies that the innovations that did surface would be more holistic than innovations created in high MO/FO societies. Therefore, high MO/FO societies are likely to be comparatively more tolerant of institutionalised power inequalities, not only with reference to gender but also age, social class, ethnicity and caste. The specific social divisions that matter in relation to a particular innovation would vary according to the particular context and the nature of the innovation itself.

Linking these insights to the five RI dimensions, it can be seen that RI—as characterised in the current Western literature—shares many principles of what Hofstede sees as key characteristics of low MO/FO cultures: the RI processes emphasise broad stakeholder involvement, including active participation of marginalised individuals and groups, from the very start of research and innovation projects; and their active engagement and even co-creation throughout project design and implementation. Participation that goes well beyond occasional token consultation is seen to be required in order to ensure effective local 'ownership' and innovation embedding. Yet, accumulated experience from development projects in various non-Western environments, particularly as reported in post-colonial and post-development literature, has shown that it is difficult to implement those principles and associated techniques effectively in societies where differences in social roles are substantial and space for independent decision-making among subjugated groups and individuals is limited (Harding, 2011). For instance, women's development project implementation can run into obstacles emanating from "the role of discriminatory gendered patterns in incentive systems, accountability structures and the bureaucratic procedures and institutional practices of development organisations" (Goetz, 1997).

Table 1 and its sub-tables summarise the indicative influences (or hypotheses) of the five cultural dimensions on the five dimensions of RI. In practical terms, Table 1 illustrates the structure of the conceptual framework. Each sub-table consists of five rows containing the five dimensions of RI; and each column contains one of Hofstede's cultural dimensions. In each sub-table, the five RI dimensions are linked with one of Hofstede's cultural dimensions. Relevant sources of literature supporting the indicative influences (or hypotheses) are within each cell in Table 1, while the hypotheses proposed on the sole basis of the researchers' own articulation are marked with **.

Table 1. Possible Effects of (National) Culture on the Dimensions of RI**1A.** Indicative Influences of Power Distance on RI Dimensions

RI Dimensions	Cultural Dimensions
	Power distance
Anticipation	<p>Anticipation is likely influenced by the way an authority/power structure defines the issues that should be anticipated and the approach taken by an authority/power structure to address such issues.</p> <ul style="list-style-type: none"> - High PD: anticipation is likely defined/taken according to the perspective/understanding/interest of superiors/formal authority. - Low PD: anticipation could be defined/taken according to the perspective/understanding/interest of members across hierarchical levels, not only by superiors/the formal authority. <p>(e.g. Herbig and Dunphy 1998)</p>
Reflexivity	<p>Reflexivity is likely influenced by trust between hierarchical levels and the opportunity for learning/understanding certain issues.</p> <ul style="list-style-type: none"> - High PD: reflexivity is likely limited by rigid bureaucracy and less opportunity for learning/understanding certain issues due to formal rules. - Low PD: reflexivity is likely encouraged through trust and informal relations across hierarchical levels and equal opportunity for learning/understanding certain issues due to the absence of rigid rules. <p>(e.g. Lane et al. 2006; Shane 1993)</p>
Deliberation	<p>Deliberation is likely influenced by way of communication and the opportunity to collaborate and share information between hierarchical levels:</p> <ul style="list-style-type: none"> - High PD: deliberation is likely limited by formal communication and less opportunity to collaborate and share information between superiors and subordinates, and limited communication across different departments and organisations. - Low PD: deliberation is likely supported by communication across hierarchical levels and equal opportunity for collaborating, sharing information and open discussion. <p>(e.g. Shane 1993; van Everdingen and Waarts 2003; Williams and McGuire 2005)</p>
Responsiveness	<p>Responsiveness is likely influenced by the degree of formality in doing things and getting things done.</p> <ul style="list-style-type: none"> - High PD: being responsive to/responding to changes is likely tied with rigid bureaucracy and formalities in doing things. - Low PD: being responsive to/responding to changes is encouraged through fewer formalities in doing things. <p>(**)</p>
Participation	<p>Participation is likely influenced by formality and the role of power structure in giving the opportunity to participate by the innovation actors:</p> <ul style="list-style-type: none"> - High PD: participation of people is likely indirect and guided by formality, regulated. - Low PD: people tend to take the initiative to participate and this is deemed to be socially acceptable, participation is typically based on equal rights and with less formality. <p>(e.g. van Everdingen and Waarts 2003)</p>

1B. Indicative Influences of Uncertainty Avoidance on RI Dimensions

RI Dimensions	Cultural Dimensions Uncertainty avoidance
Anticipation	<p>Anticipation is likely influenced by the way people behave towards uncertainty and ambiguity (i.e. risks, uncomfortable situations, etc.).</p> <ul style="list-style-type: none"> - High UA: anticipation would be focused more on how to avoid risks, conflicts, ambiguous situations, and the unknown impacts of new things. - Low UA: anticipation would be focused more on taking risks to deal with uncertainty, conflict is considered as part of life, and uncomfortable situations are considered as a natural thing. <p>(e.g. Furrer, Liu, and Sudharshan 2000)</p>
Reflexivity	<p>Reflexivity is likely influenced by whether people consider the way ‘to avoid or to take’ the consequences/impacts/risks associated with changes and uncertain situations in the process of learning.</p> <ul style="list-style-type: none"> - High UA: people are likely to consider ways of avoiding consequences/impacts/risks associated with changes and uncertain situations in the process of learning/understanding certain issues. - Low UA: people are likely to consider ways of taking and dealing with consequences/impacts/risks associated with changes and uncertain situations in the process of learning /understanding certain issues. <p>(**)</p>
Deliberation	<p>Deliberation is likely influenced by the preference level of analysis of people when dealing with certain issues or changes.</p> <ul style="list-style-type: none"> - High UA: deliberation would typically involve intellectual pursuit at the abstract level and less critical analysis when dealing with certain issues or changes. - Low UA: deliberation would typically be encouraged through the analysis of detailed data and critical analysis when dealing with certain issues or changes. <p>(e.g. Hofstede 1993; Leidner and Kayworth 2011; Moran and Abbot 1994)</p>
Responsiveness	<p>Responsiveness is likely influenced by the acceptance of people to uncomfortable situations due to certain issues or changes.</p> <ul style="list-style-type: none"> - High UA: responsiveness is typically characterised by reluctance, caution, and slow response to certain issues or changes. - Low UA: responsiveness is typically characterised by openness and quick response to certain issues or changes. <p>(e.g. Furrer, Liu, and Sudharshan 2000; Leidner and Kayworth 2011)</p>
Participation	<p>Participation is likely influenced by the extent to which people consider consensus or conflicts as the way to deal with certain issues or changes.</p> <ul style="list-style-type: none"> - High UA: people typically regard affirmation and consensus as the way to deal with certain issues or changes. - Low UA: people typically regard disagreement and conflicts as constructive parts of processes in dealing with certain issues or changes. <p>(e.g. Hofstede, Hofstede, and Minkov 2010)</p>

1C. Indicative Influences of Individualism/Collectivism on RI Dimensions

RI Dimensions	Cultural Dimensions
	Individualism/collectivism
Anticipation	<p>Anticipation is likely influenced by people's preferences with respect to individuals or group interest (i.e. to avoid certain/extreme conditions).</p> <ul style="list-style-type: none"> - IDV: anticipation is likely about avoiding extreme conditions/unpleasant situations that may affect personal interest and needs. - COL: anticipation is likely about avoiding extreme conditions/unpleasant situations that may affect communities.
Reflexivity	<p>(e.g. Chen, Lee, and Stevenson 1995; Smith 2004)</p> <p>Reflexivity is likely influenced by the way people consider the preferences of individuals or group in the process of learning/understanding certain issues.</p> <ul style="list-style-type: none"> - IDV: reflexivity typically prioritises more the individuals' interest/needs in the process of learning/understanding certain issues. - COL: reflexivity typically prioritises more to the group's interest/needs in the process of learning/understanding certain issues. <p>(**)</p>
Deliberation	<p>Deliberation is likely influenced by people's approach in taking into account the interest of individuals versus groups.</p> <ul style="list-style-type: none"> - IDV: deliberation is typically characterised by equal participation, freedom to express individuals' opinion, and reasoned argument in reaching consensus. - COL: deliberation is typically characterised by willingness to keep harmony, be considerate to social cues, and with limited freedom to express individual opinion. Persons of authority are deemed to be the legitimate spokespersons on behalf of groups in gatherings, so there is less direct plenary deliberation. <p>(e.g. Min 2009)</p>
Responsiveness	<p>Responsiveness is likely influenced by the way people weigh the interest of individuals versus group.</p> <ul style="list-style-type: none"> - IDV: individualistic cultures tend to be responsive to changes that affect the individual's interest. - COL: collectivistic cultures tend to be responsive to changes affecting communities. <p>(e.g. Chen, Lee, and Stevenson 1995; Smith 2004)</p>
Participation	<p>Participation is likely influenced by people's value principles in managing relationships.</p> <ul style="list-style-type: none"> - IDV: participation of people is typically characterised by the principle that each individual takes his/her own responsibilities, tends to encourage competition between individuals. - COL: participation of people is typically characterised by regarding individuals' contributions as belonging to the organisation, and encourages collaboration between individuals. <p>(e.g. Karwowski 2006; Min 2009)</p>

1D. Indicative Influences of Long/Short-Term Orientation on RI Dimensions

RI Dimensions	Cultural Dimensions
	Long/short-term orientation
Anticipation	<p>Anticipation is likely influenced by the goal-orientation of people when dealing with the present and future challenges</p> <ul style="list-style-type: none"> - LTO: anticipation is likely encouraged by future-oriented goals, focusing on thrift and perseverance, taking into account long-term pay-offs as the way to deal with present and future challenges. - STO: anticipation is likely encouraged by tradition-oriented goals, the past and present achievement, and the fulfilment of social obligations as the way to deal with present and future challenges. <p>(e.g. Steensma et al. 2000)</p>
Reflexivity	<p>Reflexivity is likely influenced by the way people take into account their goal-orientation in the process of learning/understanding certain issues.</p> <ul style="list-style-type: none"> - LTO: reflexivity is likely encouraged by taking into account future-oriented goals in the process of learning/understanding certain issues. - STO: reflexivity is likely encouraged by taking into account tradition-oriented goals in the process of learning/understanding certain issues. <p>(**)</p>
Deliberation	<p>Deliberation is likely influenced by the concern of people regarding long-term and short-term benefits/payoffs.</p> <ul style="list-style-type: none"> - LTO: people would likely place more concern on the long-terms payoffs. - STO: people would likely place more concern on maximising short-term gains. <p>(e.g. Steensma et al. 2000; Veiga, Floyd, and Dechant 2001)</p>
Responsiveness	<p>Responsiveness is likely influenced by the way people consider the past/present achievement versus future opportunities associated with certain issues or changes.</p> <ul style="list-style-type: none"> - LTO: response to changes is likely characterised by a pragmatic approach with an emphasis on future opportunities. - STO: response to changes is likely characterised by a normative approach and encouraged when the traditions or past success are shown to be wanting. <p>(e.g. Veiga, Floyd, and Dechant 2001)</p>
Participation	<p>Participation is likely influenced by the way people regard status and relationships.</p> <ul style="list-style-type: none"> - LTO: status and relationships are likely regarded as important in the participation of people. - STO: status is likely not regarded as a major issue, but the bottom line of the issues is typically regarded as more important than relationships in the participation of people. <p>(e.g. Hofstede, Hofstede, and Minkov 2010)</p>

1E. Indicative influences of Masculinity/Femininity on RI Dimensions

RI Dimensions	Cultural Dimensions
	Masculine/feminine orientation
Anticipation	<p>Anticipation is likely influenced by the way people interpret anticipation as convenient means for their individual goals or group's goals.</p> <ul style="list-style-type: none"> - MO: dominant stakeholders are likely to interpret anticipation in an instrumental way, as a convenient means to further their own individual goals. - FO: anticipation would be geared towards preventing and redressing inequitable outcomes from research and innovation across different social groups or adverse effects for the broader environment. <p>(**)</p>
Reflexivity	<p>Reflection in research and innovation is likely affected by the extent to which people set the scope of their view.</p> <ul style="list-style-type: none"> - MO: reflexivity is likely to have a limited (economic) scope. - FO: one would expect people to take a broader view, and greater willingness to engage in collective reflexivity processes with stakeholders in diverse power and interest positions; more willingness to learn collectively from experience to make innovation adaptations along the way to obtain socially better results. <p>(**)</p>
Deliberation	<p>Deliberation is likely affected by the extent to which people value social exchange and network formation to take different perspectives on board for achieving socially useful innovations and engage in consensus building for a solid social support base.</p> <ul style="list-style-type: none"> - MO: extensive stakeholder deliberation is likely to be viewed as a waste of time. - FO: extensive stakeholder deliberation is likely to be viewed as valuable. <p>(**)</p>
Responsiveness	<p>Responsiveness is likely affected by the way people value the profitability of the issues at stake.</p> <ul style="list-style-type: none"> - MO: subjugated stakeholders will be less empowered to respond and may need support from agencies like NGOs and CBOs to gain the confidence and skills to speak out in public, engage in protests, enter into confrontational negotiations, and so on. Dominant innovation stakeholders can be highly empowered and pro-active where financial profitability issues are at stake, but not in regard to social or environmental issues. - FO: more consensual negotiation and joint responsive approaches can work, but innovators may be less decisive to address emerging obstacles and strongly push their ideas towards financial sustainability. <p>(**)</p>
Participation	<p>Participation is likely affected by the assertiveness of people to participate.</p> <ul style="list-style-type: none"> - MO: one should expect many obstacles to participation to arise for non-assertive, subjugated groups. They may need social organisation and coaching by NGOs and CBOs to become more empowered for effective participation. Direct participation of some groups may not be deemed socially acceptable or even unnecessary. - FO: such issues (like in MO) are likely to be less prominent. <p>(**)</p>

Since Table 1 highlights only indicative influences, we might ask: how can we use it in practice? We can refer first to Hofstede's index scores, which have been constructed and validated from research to explain cultural behaviour in many nations, to identify the scores of a country's cultural dimensions (Hofstede et al., 2010). (note 2) We can follow the rule of thumb suggested by Hofstede: a cultural dimension with a score above 50 is regarded as high, and below 50 is regarded as low. For instance, a score above 50 for individualist orientation (IDV-COL) denotes an individualistic-oriented society, while a score below 50 is regarded as a collectivistic-oriented society, etc. When linking cultural dimensions with RI dimensions, we can also concentrate on the cultural dimensions that have the highest or lowest scores rather than those with medium scores, so as to single out the linkages that will most likely reflect the most significant influences of culture on RI. For example, Hofstede gives Indonesia 78 on power distance, 62 on long-term orientation, 48 on uncertainty avoidance, 46 on masculinity, and 14 on individualism, suggesting that the country has a distinctively high power distance and a collectivist orientation. In this case, one could concentrate on the hypothesised linkages of power distance and individualism/collectivism with RI dimensions in Table 1.

However, since Table 1 does not provide ready prescriptions on "how to do" RI in different cultural contexts, we also recommend that researchers and innovation actors engage in more detailed examination of these linkages. To facilitate this, we propose a number of practical questions that could be useful when attempting to apply the RI approach in different cultural settings. These are summarised in Table 2, which should be regarded as a general guidance frame. The number of questions could be extended, depending on the researchers' purposes, needs and context.

The insights one can get from applying Tables 1 and 2 for undertaking an RI process in a particular context can shed light on appropriately conducting the five dimensions of RI in accordance with societal values. For example, the exercise would provide information or ideas about the kind of approach that could be effective for involving stakeholders in a deliberative dialogue about a plan for developing or adopting a new or emerging technology. Table 1 can be used as a starting point to sensitise researchers and innovation actors to the relevant issues. It does not provide ready answers, but it can trigger the right kind of focus points and reflexive questions along the lines of Table 2 that can guide the conduct of five dimensions of RI most effectively and ethically according to certain cultural settings.

Although the length constraints of this paper preclude the inclusion of a full practical application of the framework, a few preliminary illustrations in Asian settings of certain aspects are given here to convey a sense of how it could work in practice.

Vanuatu in the Pacific is a society with high power distance. A study about multi-stakeholder innovation experiments for sustainable water management in that environment (Poustie et al., 2016) makes it clear that the plenary participation of all relevant stakeholders in a common forum format that would work well in less-hierarchical European cultures did not result in satisfactory deliberation. In the plenary events, "...cultural considerations resulted in invitees holding an equivalent position of power strategically planning to minimise cultural shame associated with disagreeing with someone in a higher position of power..." (p. 132). The project management resorted to so-called 'mediated participation', which involved holding separate workshops for specific subgroups of stakeholders. These additional smaller events provided opportunities for stakeholders to voice their views without fear of confrontation, allowing new ideas and criticisms to find their way into the broader innovation deliberation process through mediating facilitators.

Table 2. Questions to Consider for a Culturally Sensitive Conduct of RI

RI Dimensions	Diagnostic questions to gain insight into the influence of cultural dimensions
Anticipation	<ul style="list-style-type: none"> ▪ Power distance: <i>How do people foresee and anticipate certain issues? To what extent are they affected by the superiors' approach?</i> ▪ Uncertainty avoidance: <i>How do people cope with uncertainty? Do they prefer to avoid or to take risks and can accept unknown impacts of new things?</i> ▪ Individualism/collectivism: <i>Does people's anticipation of a certain condition come from interests of individuals or group?</i> ▪ Long/short-term orientation: <i>Do people consider future-oriented goals or look at present achievement when dealing with the challenges ahead?</i> ▪ Masculine/feminine orientation: <i>How do people interpret anticipation? Do they interpret anticipation in an instrumental way or as way to prevent adverse effects?</i>
Reflexivity	<ul style="list-style-type: none"> ▪ Power distance: <i>Is the learning process on certain issues bound by formal rules and strict procedures? How?</i> ▪ Uncertainty avoidance: <i>Do people take into account the way to avoid risks associated with certain changes or uncertain situations in the learning process?</i> ▪ Individualism/collectivism: <i>How do people take into account the preference of individuals or group in the process of learning? Which preferences or interests do they prioritise more?</i> ▪ Long/short-term orientation: <i>Do people take into account future-oriented goals in the process of learning and understanding certain issues, or do they use existing norms and value sets as their dominant frame of reference when making sense of new experiences?</i> ▪ Masculine/feminine orientation: <i>How do people set the scope of their view? Do they take limited or broader view?</i>
Deliberation	<ul style="list-style-type: none"> ▪ Power distance: <i>How do people usually communicate and share their ideas with each other? To what extent do the formalities or hierarchical levels and official lines of authority matter in communication between individuals?</i> ▪ Uncertainty avoidance: <i>Are people used to embrace critical analysis and more detailed data when planning or discussing something?</i> ▪ Individualism/collectivism: <i>Which interests matter most to be considered, individuals or group related interests?</i> ▪ Long/short-term orientation: <i>Do people take into account long-term pay-offs when exploring new things?</i> ▪ Masculine/feminine orientation: <i>Do people view deliberation process as a waste of time or as valuable?</i>

Responsiveness	<ul style="list-style-type: none"> ▪ Power distance: <i>How do people see and respond to changes or new things? Do they accept changes due to order from authorities?</i> ▪ Uncertainty avoidance: <i>Does people's uncertainty avoidance make them cautious to respond to certain changes or new things?</i> ▪ Individualism/collectivism: <i>Do people show fast response to certain changes that affect the individuals' interest?</i> ▪ Long/short-term orientation: <i>Do people aim for future pay-offs when adopting new things?</i> ▪ Masculine/feminine orientation: <i>Do people value the profitability of issues at stake based on financial stability?</i>
Participation	<ul style="list-style-type: none"> ▪ Power distance: <i>Do people get involved in something through formal orders or in voluntary ways? Are they in equal positions to express their ideas in a discussion, and to attend meetings and to receive information about opportunities to become involved in deliberation?</i> ▪ Uncertainty avoidance: <i>Do people seek for participatory consensus and affirmation when dealing with certain issues or changes?</i> ▪ Individualism/collectivism: <i>Are participatory contributions regarded as belonging to individuals or group? Do people take their own initiatives and responsibilities when getting involved in something?</i> ▪ Long/short-term orientation: <i>Is an individual's status regarded as important when involving someone in a discussion?</i> ▪ Masculine/feminine orientation: <i>Do people seek for effective participation?</i>

Another example comes from a RI experiment in Jakarta to explore different ways of CO₂ utilisation with participants from government, the oil & gas sector, consultants and academia. The first author of this paper together with a colleague from Universitas Indonesia, both versed in RI theory and practice, guided and facilitated the RI processes, which aimed to explore the potential areas of application and impacts of CO₂ utilisation, considerations for CO₂ utilisation development, and strategic actions for CO₂ utilisation development. The experiences from a workshop indicate that in a high PD culture like Indonesia, acknowledgment of importance of the purpose and motivation of CO₂ utilisation stated by the stakeholder in authority, i.e., the government was prevalent. The non-government participants waited for the government participants before expressing any views of their own, and they tended to formulate their these in alignment with the government stakeholders. One can also see this as evidence of consensus-seeking, non-confrontational behaviour, which is characteristic of a collectivist culture. Open plenary discussion in this setting proved difficult. Additional individual interviews were held by the workshop facilitators to gain a more authentic impression of what occupied the participants' minds. It also proved crucial to understand and adhere to hierarchical relations. In a society with strong hierarchy like Indonesia, people of the right level of seniority were needed to gain sufficient traction among stakeholders for certain innovation plans and the non-governmental stakeholders were clearly comfortable with a top-down approach, in contrast to what is commonly observed in Western European contexts where possibilities for participation are generally considered essential (Setiawan, 2018: 153-170).

Preliminary as they are, these cases illustrate that societal cultural differences can strongly affect how responsibility is understood by actors and how research and innovation procedures can and should be attuned to these differences for better results.

5. Conclusion

This paper has shown that RI is still an evolving idea and approach, in need of further refinement. In particular, more inquiry is required for its appropriate cultural contextualisation to make the approach more applicable in practice. Asian cultures in particular have attributes that make them very different from the Western cultural environment in which RI emerged. We addressed the issue by proposing a conceptual framework that can be used to think about the relationship between culture and RI—that is, by linking the five cultural dimensions elaborated by Hofstede with the five RI dimensions commonly adopted in the RI literature. By doing this, we evolve RI towards a culturally sensitive innovation approach.

Linking Hofstede's cultural dimensions to the RI dimensions has three practical benefits. First, it suggests that the operationalisation of RI in a culturally appropriate manner is likely to contribute to increased effectiveness of the approach by enhancing its social acceptability. Second, the indicative influences listed in Table 1 can be a starting point for further examination by researchers across different cross-cultural contexts. The conceptual framework offers a broad-based approach, i.e. one that is not bounded by comparisons between particular national cultures. Third, the framework makes it possible to clarify and further investigate and address the linkages between societal culture and RI dimensions in an effective, focused and structured way. In addition, the conceptual framework could also be useful as a guide for evaluating RI processes, in order to discover culture-related reasons why they succeeded or failed in particular contexts.

We recommend that researchers use the proposed conceptual framework in real innovation projects that would reflect the pursuit of RI in different cultural settings. The results can be used to further improve and validate the proposed conceptual framework. Ultimately, what this paper has tried to emphasise is the importance of evolving a more comprehensive approach of RI that has relevance across different cultures by making the key cultural aspects explicit, thus facilitating a well-tailored design and implementation of the different RI dimensions. Cultural dimensions other than those developed by Hofstede could also be employed as a basis for exploring linkages with RI dimensions; in addition, influences on the conduct of RI with alternative conceptions of culture, i.e. cultures in organisational and epistemic communities, could be investigated. We also recommend future research on how cultural aspects affect the way in which different RI dimensions themselves are chosen or preferred to be used in practice in different contexts – something which is beyond the scope of this paper. RI can never be a socially disembedded process; it has to be practised at a particular time and place. Its aims can differ accordingly, as would its interpretation and application. Improving the knowledge base on how RI can be contextualised effectively in different geographical and societal situations will help to set it free from its present Western confines so that it can evolve into a truly mature research and innovation approach.

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Notes

Note 1. Culture can also refer to shared norms and values within certain specific epistemic or organisational communities, but the focus of this paper is limited to societal/national culture because this has been a particularly neglected issue in the extant RI literature.

Note 2. Hofstede's scores for a large number of countries are available at <https://www.hofstede-insights.com/product/compare-countries/>