Creating Value Through Crowdsourcing: The Antecedent Conditions

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Abstract. The benefits of crowdsourcing are becoming more widely understood and there is a methodological move towards organisations using "participatory models" to engage stakeholder communities and align decision making more closely to the needs of stakeholders. Many tasks can now be distributed to "the crowd" for action. Our research aims to understand the antecedent conditions that inform management decisions to adopt crowdsourcing techniques as a means of value creation. Our preliminary findings suggest that to be successful, three antecedent criteria must be met – the task being crowdsourced must be modular in nature, a community of interest must be engaged, and there needs to be a structural capability within the organisation to be able to facilitate the engagement of the crowd and utilise the output from the crowd in a manner that creates value.

Keywords: Crowdsourcing · Strategy · Open-innovation · Online community · Social media

1 Introduction

Crowdsourcing has been defined as a "type of participative online activity in which an individual, an institution, a non-profit organization (…) proposes to a group of individuals (…) via a flexible open call, the voluntary undertaking of a task" [1]. This is usually through the use of social media technologies - "a group of Internet-based applications that…allow the creation and exchange of user generated content" [2]. A review of the literature on this topic demonstrates that challenges facing organisations seeking to utilize crowdsourcing include developing an operational perspective of how sustainable competitive advantage can be appropriated through meaningful e-engagement with stakeholders.

The aim of this research is to establish an understanding of those antecedent considerations that inform management decisions to adopt crowdsourcing as a means of creating value.

1.1 Crowdsourcing Profile

At the outset it must be recognised that crowdsourcing is not one single thing, rather it covers a variety of activities, behaviours and outcomes. Typologies have been

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proposed by a range of theoreticians including Schenk and Guittard [3] who define the nature of the process of crowdsourcing as either integrative (through using pooled and unedited data), or selective (by identifying and integrating only part of the full set of responses). They further categorize the type of task being offered to the crowd as routine, complex or creative [3] and in doing so provide an intuitive framework for identifying and classifying crowdsourcing activity.

It has been demonstrated that crowd-based inputs can enable better decisions, are typically less expensive, and more suitable to adaption than in-house equivalents [4–6]. As the diversity of application grows, crowdsourcing is transitioning from being the fundamental business model of purpose-built entities (for example, TripAdvisor providing crowdsourced guidance to travelers, and iStockphoto a platform for the sale of crowdsourced photographic images) to a management practice that can be selectively employed within parts of an enterprise to create value.

While the general awareness of crowdsourcing in the business community has increased as online modalities of value creation become more widespread, the utilization of the technique remains contingent on a belief in the minds of management that outcomes so obtained will be in some measure better, cheaper or favourably distinguished from outcomes realized through conventional outsourcing practice. The boundaries delineating the opportunity to crowdsource are currently ill-defined and management perspectives of the actual practice of crowdsourcing, and the operational constraints that may impact on the technique's ability to contribute to value creation, are not well understood.

1.2 Literature and Methodology

While a body of literature exploring the role of crowdsourcing across a range of applications is emerging, it is mostly focused on crowdsourcing itself – processes, taxonomies, performance and constraints – rather than seeking to understand the circumstances that may lead a decision-maker to the consideration of crowdsourcing as an appropriate technique for value creation. In a comprehensive survey of publications related to crowdsourcing, Zhao and Zhu [7] note that while 64 % of articles used empirical methods, almost all of these articles related to events and/or processes. In other words the literature is oriented towards classifying existing models rather than understanding the preconditions that enable those models to function in the first place.

Where recent research seeks to explore the decision to crowdsource, it draws from literature rather than interaction with those active in the field. For instance, Thuan, Antunes & Johnstone [8] utilised a structured literature review to derive a model that positioned the decision to crowdsource as mediated by four factors; environment, management, people and the particulars of the task. This model does not anticipate a broader set of drivers of behavior, nor necessarily preconditions whereby a crowdsourced solution may provide greater opportunities for value creation than conventional methods.

To begin addressing these issues, open-ended conversations with eight participants were undertaken in order to obtain the perspective from experienced decision-makers in this area. The open-ended conversation format adopted aimed at: (i) building rapport

with participants; (ii) obtaining detailed and nuanced perceptions, and (iii) developing an accurate narrative that includes the meaning of the experiences from those involved in the situation (in the social constructionism tradition of Berger & Luckmann [9] and, more recently, Eriksson and Kovalainen [10]). In this perspective, we have elicited a narrative as a "way of knowing that is different but complementary to logical-scientific knowledge" [11]. Two initial outcomes arose from this approach: the first relates to the meaning to the respondent; the second informs the literature by identifying aspects not previously considered.

1.3 Routine, Complex or Creative

The organisations identified for involvement in this research typically address issues that are either inherently complex to the point of being "wicked" problems, or ones requiring novel or creative approaches with the potential to lead to truly innovative outcomes.

Crowdsourcing of purely process-based tasks - those that require little if any domain specific knowledge - can be undertaken through engagement of undifferentiated individuals without specialist insight or alignment with a community of interest. For example the citizen science site Galaxy Zoo [12] requires simply that the user identify features on satellite photographs of indistinct objects in space. The degree of expertise required is minimal, and lack of prior association with the subject matter will not yield less valuable results for the organisation.

When the nature of the task begins to require a greater depth of understanding, the harnessing of the thoughts of random individuals may provide results with a poor signal to noise ratio [13]. For this reason, where opinions or specialist insight is required to fulfil a task, the organisation may seek out communities of interest, or introduce moderating mechanism to filter usable information from that of less practical contributions [14].

As part of its 10 year plan, the City of Melbourne, Australia has developed a virtual budget simulator tool that enables ratepayers to provide their preferred apportionment of the City's overall budget across the five main categories of Deliver Community Services, Activate City, Advance Melbourne, Design, Build and Manage Assets, and Regulate, and numerous sub-categories [15]. The simulator shows current levels of expenditure in each category and provides controls for the user to propose variations to future spending according to their own individual preference. As the pre-dispositions of individuals participating may make their inputs inconsistent with the broad responsibilities of the City, the data is collated and referred to a panel of 43 residents for moderation. Membership of this panel reflects the demographic composition of the city. The panel then considers the respondent data and provides recommendations to the Council's budgeting process. This is an example of a *community* being engaged, with a moderation process refining crowd inputs. Membership of this community is implied by being a ratepayer of the municipality, and having the interest to participate [16].

Communities are not necessarily passive in nature. A prominent example of this is the Danish toy manufacturer, Lego. Lego practices a form of open innovation that formally places the user community at the centre of the product innovation effort [17].

"Adult Fans of Lego" (AFOLs) form Lego User Groups (LUGs) based around either geographic location or common interests. Lego puts in place relationship agreements to officially recognize these groups and this provides the basis of a formal and legally constituted means of interacting and soliciting ideas for new products and new strategic directions for the company. These user groups form what's known as LUGNET – or the Lego User Group Network. The Lego communities developed spontaneously, on forums that are operated independently from the company. Activity on these sites is driven by the needs of the members to associate and share their passion for the product [18]. As such these communities can be described as authentic and autonomous.

Contrast this with innovative camera developer Lytro [19] and Australian software developer MYOB [20]. Both of these companies operate moderated forums on their own company websites through which they engage customers and stakeholders in the product development process. These communities may be considered "captive" as all activity happens on a forum site owned and operated by the respective companies. It may be argued that authenticity is critical when engaging communities of interest but if the organisation is embedded or closely moderating the group a form of adverse selection may take place where the community feeds back to the company what they think the company wants to hear [21].

Stakeholder Engagement or Community Conversations. One alternative approach organisations can adopt is to side-step the stakeholder engagement process altogether and turn instead to the data contained in the community conversations [22]. This marks a transition from *asking* the community, to *watching* the community, then analysing and interpreting directly from the conversations taking place within that community. New cloud-based artificial intelligence algorithms coupled with semantic connectivity and topic modelling tools enable deep and coherent insights to be developed from text-based datasets. While still in its infancy, his represents a compelling and possibly controversial option for enterprises seeking to better understand the needs and priorities of their involved stakeholder groups [23].

To summarize these perspectives Fig. 1 depicts a typology of crowdsourcing that illustrates an empirical relationship between community type and crowdsourced task type. It demonstrates the potential for organizations to transition from engaging their communities interactively, to surveillance, data mining and subsequent semantic analysis of authentic and spontaneous discussion threads.

2 Issues

While the promise of crowdsourcing is attractive the reality may be more problematic. Tasks that can be crowdsourced are often (if not always) tasks that have previously been undertaken using "conventional" means – there are few if any crowdsourced outcomes that cannot be obtained some other way. If, for example a firm seeks to better understand the features its customer wants included in its next model release, a market research program would normally be undertaken. This prompts the question of what antecedent conditions need to be satisfied for a manager to utilize the crowd in place of a specialized resource, and how might the crowd's participation in the decision making

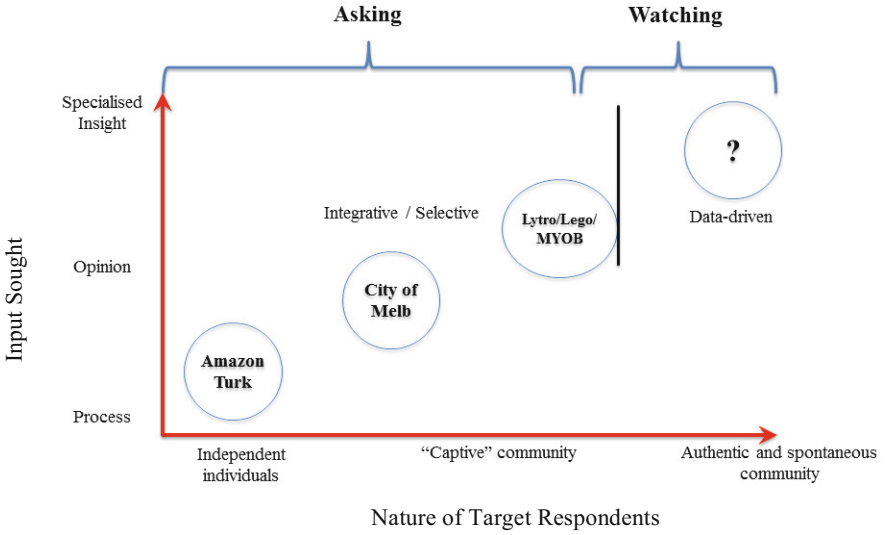

Fig. 1. Categorisation of crowdsourcing participation models by community

of the organisation provide management with greater value than alternative courses of action? Implicit in this is an understanding of the inflection point when the nature of the proposed task moves from the domain of mediated interaction with third party service provider to pure crowdsourcing. An antecedent set of criteria must be in place and satisfied for organizational decision-makers to select crowdsourcing as a viable alternative to more conventional forms of interaction, or indeed no interaction at all. This requires both an awareness and understanding of the role crowdsourcing might play on behalf of the manager, and a capability for the organisation to be able to undertake the crowdsourcing activity.

2.1 Decision Making Methodology

From an organizational perspective, crowdsourced tasks can be seen to satisfy two types of need: operational or strategic. Operational tasks are routine and integrative in nature, and are typical of the tasks that are performed through platforms such as Amazon Turk [24]. These are pure outsourced business processes and do not engage the collective intelligence of the crowd [25]. Contrast this to strategic tasks which move the locus of option generation effectively beyond the walls of the organisation and locates it amongst an undifferentiated but not disinterested crowd.

Dibbern [26] provides a useful survey of decision theory literature and methodological frameworks including Agency Theory, Transaction Cost Theory, and a number of other methodology approaches that are focused on perspectives such as the impact of politics within an organisation, the nature of the organization's relationship with external parties, and the resource base of the organisation. This assemblage of

methodological foundations does not however reveal the steady emergence of a dominant model but rather summarizes the theoretician's struggle to account for the range of factors influencing management decision-making.

If the theory cannot agree then modelling the practice may provide a methodology for the reflection of reality. An early process model proposed four stages of decision making: intelligence, design, choice and implementation [27]. "Intelligence" denotes the identification of the issue to be addressed, "design" is the formulation of the range of potential methods to address the issue, "choice" is the selection of the desired solution, and "implementation" is the execution of that solution. As a generic decision making model this has value but it assumes a purely rational approach. Simon subsequently built on the work of Barnard [28] to propose two additional elements that influence the management decision making process: intuition and emotion.

> "The sources of these non-logical processes lie in physiological conditions or factors, or in the physical and social environment, mostly impressed upon us unconsciously or without conscious effort on our part. They also consist of the mass of facts, patterns, concepts, techniques, abstractions, and generally what we call formal knowledge or beliefs" [27].

Combining the rapidly changing nature of methodological tools that connect communities to organisations and the expectation of users embracing this technology, purely rational decision-making models fall short of capturing the effects of uncertainty in the process. Methodological models based on the inclusion of emotional attributes may be too ill-defined to offer predictive or interpretive value.

2.2 Sensemaking Attitudes

In the context of uncertain and rapidly changing environments issues of organizational sensemaking and knowledge creation become inextricably interwoven with the decision making process [29]. Sensemaking "constructs the shared meanings that define the organization's purpose and frames the perception of problems or opportunities that the organisation needs to work on" [29]. In this context it is an action concerned as much with looking forward as it is with constructing a narrative in retrospect. It is into this context that the participants in this study will fall.

Two attitudes were prevalent among the organisations observed. The first related to the potential for disadvantage through incomplete knowledge. When constructing a forward-facing view of the environment there was a clear sense that while the manager may not have understood the competitive advantages or limitations of the new technology, failure to include it in the planning process would represent a form of failure. In this case there was a perceived disconnect between those that had responsibility for making the decision to crowdsource, from those that had the technical ability to implement that decision.

The second attitude was the belief that this was a phenomenon driven by social forces and not business needs. There was a very clear indication of technology leading the development of strategy rather than serving it. In general the push to sensemake was seen as a net reducer of opportunity and a distraction to "business as usual". Accommodating it in a way that created value was perceived to be risky and in many cases to attract additional costs that could not easily be offset by strategic gains.

3 Three Antecedents for Crowdsourcing

A prime purpose of strategy formation is to align the activities of the organisation with the unmet needs of the stakeholder. This implies an antecedent condition requiring that the subject of the task in strategic crowdsourcing will be designed so as to enable change - the subject must have modular characteristics i.e. be able to change one aspect to optimize that characteristic without the necessity to change the entire subject. Modularity in product design has been held to improve the acceleration of innovation. [30, 31]. This modularity may extend to product features, policy settings or reconfiguration of core competencies. Products or services that are tightly bound to one form (because of regulatory, intellectual property, market share constraints or simply the inherent properties of the product or service) will derive little value from adopting crowdsourcing techniques.

A second antecedent that must be satisfied is the presence of an accessible and engaged community. This can be either fostered by the organisation (less authentic) or one that has spontaneously organized outside the organisation (more authentic) [32]. The degree of authenticity is perhaps correlated with the quality of commitment and thus the sincerity of response. It was observed that not all communities of interest are equal. Spontaneous communities that self-organize with neither the knowledge nor the guidance of the offeror were seen to provide better quality of input than that obtained by communities maintained on an organization's website and moderated by members of the organisation. This is consistent with prior research, particularly in respect of dedicated online brand communities (OBCs) [33]. However interacting with the communities that formed independently of the organisation was perceived to carry with it the potential for greater reputational damage as the entity was unable to moderate or influence discussions directly. Management's awareness of the need for community is a given. Management's understanding that better results come from uncontrolled and spontaneously formed communities is less clear.

A third antecedent is an organizational structure that respects and resources the process and provides forward budgeting that allows for the inherent uncertainty that goes with devolving the creation of new ideas and insights to external parties. In practice this was seen to be problematic. Crowdsourcing may consume more resources and be more difficult to manage than expected. This is broadly consistent with research on the diffusion of technological innovation throughout business [34]. The operating structure of organisations is shaped by the existing demands of customers and stakeholders. Management efforts to make processes more efficient reinforce existing practice and reduce opportunity for variation [35]. When a new category of business activity is identified, the understanding of both the operational overhead required to implement the technology and the nature of returns to be expected from the activity is frequently unrealistic. This happened historically with the introduction of desktop computing, development and integration of Internet sales channels, and the adoption of social media into strategic marketing plans. It is only when a dominant design emerges across a range of organisations and industry sectors that a degree of predictability emerges in the planning and execution of initiatives [36]. There is a need to appreciate that this is a dynamically developing and specialist area. A piecemeal approach and lack of dedicated resources will not necessarily lead to desired outcomes.

3.1 Decisions to Resource Crowdsourcing

A participant in this research noted that management decisions to resource programs of innovation and change are budgeted on the basis of cost, time to complete and anticipated contribution to the achievement of strategic aims of the organisation - the project is defined in advance of resources being committed. The observation was made that when crowdsourcing is employed to generate strategic direction the decision to resource must be made before the specific nature of the proposed activities is known. Most organisations manage resources well but inherently leave relatively little slack available to be flexibly deployed in the service of emergent ideas. Attempting to adopt crowdsourced outcomes within an organizational environment such as this will compromise outcomes and cause unnecessary stresses within the organisation.

Decision making without the power to apply those decisions is disabling not enabling. Adopting an organizational structure that doesn't merely include crowd responses as an input to the decision making process, but that embraces them (with some qualification) as the answer to the task, achieve better results than other approaches [37]. In all cases the crowd inputs from decision-making activities were filtered by the offeror prior to being accepted. This mediating role of the responsible manager provides the opportunity for qualitative assessments to be made to ensure congruence with the strategic aims of the organisation. Novel mindsets and "left-field" thinking is valuable but only when it doesn't conflict with defining organizational intangibles that are often built up over a considerable time period. Managers quoted the need for pragmatism, and the need to satisfy internal constraints and often complex policy prerogatives as reasons for this filtering process. The risk is that inputs that are judged to be inconsistent with existing management views are discarded thereby limiting the potential effectiveness of the crowdsourcing activity. Part of management thinking before embarking on crowdsourcing is that a "safety valve" is required and peace of mind is gained through management control over the degree of utilization of final inputs.

The presence of these three conditions enables a mode of market interaction which, rather than reproduce organisations as systems of control, configures operations as a "discursive contested place of encounter and exchange" [38].

4 Conclusions

The practice of blurring the boundaries between organisations and their constituent stakeholders has considerable merit when considered under the right circumstances. The awareness of crowdsourcing as a management option has perhaps never been higher. Misapplied, or applied in situations not naturally conducive to the inclusion of outside parties may lead to problematic outcomes. For this reason, studies of crowdsourcing practice as it is happening, and observing the limitations and basic criteria for successful implementation are an important step forward. As the model transitions out of specialist pure-plays and becomes a feature of everyday life so can incremental advantages be expected to accrue. When organisations no longer have to take best guesses at stakeholder requirements but can integrate the stakeholder's viewpoint in an

empowered, authentic and immediate manner, outcomes for all may reasonably be expected to improve.

The research has found that in order for crowdsourcing to be successfully undertaken three criteria must be met – the subject of the task being crowdsourced must be modular in nature i.e. elements of the subject must be able to be changed without compromising the integrity of the whole. Secondly a community of interest must be engaged. With the widespread adoption of social media technologies identifying or creating these communities is often straightforward. Finally, there needs to be a structural capability within the organisation to be able to both engage the crowd and utilize the output from the crowd in a manner that creates value. The potential for using semantic connectivity methodology and cloud-based artificial intelligence algorithms to interrogate data collected from user discussion forums is apparent, but no examples of this have come to the researchers' attention.

Implications for management of crowdsourcing projects are that structural capabilities must be in place and resourced ahead of the commencement of a crowdsourcing program.

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