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Crowd-deliberation as an organizational problem solving tool

David Passig Nirit Cohen Liad Bareket Ofer Morgenstern

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Introduction

Crowdsourcing has been proven to be a highly successful platform for generating ideas and innovation (Brabham, 2013, Howe, 2008). Technology developments facilitate the involvement of diverse crowds in online collaborative processes and enable them to generate new ideas (Bayus, 2013). As social networks evolve, business organizations are now using crowdsourcing tools internally within the company to identify new trends and come up with innovative business solutions. This may be done in order to come up with new R&D products, to reduce cost and to deal with other business challenges the company is facing (Bjelland & Wood, 2008; Stieger, et al, 2012). However, information systems are moving away from the initial form they were designed to newer forms of practice, and "practice" is identified as a field that should be taken into serious consideration by researchers (Whittington, 2014). The emergence of social networks in the workplace, and specifically crowdsourcing tools, unveils a new opportunity— an opportunity to tap into employee's minds with regard to HRM topics such as organizational strategy and cultural challenges, which the organization is facing.

While striving to understand employee sentiment or position on topics, nowadays organizations typically use traditional methods such as interviews, surveys or face-to-face focus-groups. These methods are typically "closed" conversations in which the organization defines the question and employees respond. Surveys are one-to-many, meaning individuals responds for themselves without the ability to converse about the response with the organization or other colleagues. Focus groups do allow for this conversation, but they are limited by the number of participants who can attend and are very heavy lifting for the organization.

Our study set out to explore whether online crowdsourcing ideation tools, which have been successful in creating many-to-many conversations around innovation, can also be used for HRM

purposes such as organizational strategy and culture problem solving, sensing, and employee participation purposes. While the need to develop crowdsourcing processes that can be used as a higher level, dynamic, task-based crowd teaming was already identified (Vukovic, 2009), prior research suggests that while online employee participation tools are claimed to be "open", "social" and "participative", the actual experiences of employees suggests that employee participation may be no more "social" "open" or "participative" than traditional methods of participation (Denyer, et al., 2011).

In this study we suggest that the technology is not the single driver for a creation of a new participative form of employee discourse. While technology and crowdsourcing tools bring new possibilities, HR professionals should develop the appropriate processes to be able to engage employees and drive meaning and results. For this purpose we derived two research questions – Can organizations successfully use online tools for internal cultural problem solving or strategy planning and what constitutes an effective process to do so, assuming that a constructed, processes method is required?

Thus, this paper aims to describe an emerging practice of employee participation through crowd-deliberations in strategy formation and cultural problem solving. We describe here an attempt by Intel Corporation to involve employees, thorough crowd-deliberations, in a strategic planning process around The Future of Work theme. The case-study presented here represents an example of how organizations can harness their employees' wisdom as part of internally facing HR oriented ideation process. Such crowd-deliberations have the potential to shape the future of both the future of the company and its employees.

The idea of using crowdsourcing as a Human Resource Management (HRM) tool is grounded in the established theory of employee participation combined with the body of research on innovation generation and the wisdom of the crowds. Our aim in the current paper is first to review

and combine organizational theory on (a) employee participation with (b) innovation and ideation through crowdsourcing; and then to present the procedure and results of a business case: crowd-deliberation on "The Future of Work" as an HRM tool for ideation, upward communication and employee engagement.

Employee participation in decision making

The idea of Participation in Decision Making (PDM) is based on the idea that participatory management practices balance the involvement of managers and their subordinates in information-processing, decision-making or problem-solving endeavors (Wagner, 1994). In the business and management literature it is widely argued that employee participation increases employees' involvement, motivation, job satisfaction and performance (Cotton, 1993; Hyman & Mayson, 1995; Lawler, 1986).

A review of empirical studies by Cotton et al (1988) indicates that there are different types of participation in decision making (PDM): participation in work decisions, consultative participation, short-term participation, informal participation, representative participation, and employee ownership. It is argued that employee participation is a multidimensional and multi-form concept. Not all forms of employee's participation have the same value and outcomes and that methodological variation such as research setting and participants' characteristics are important factors in the ability to demonstrate a positive effect of participation on various dependent factors (Miller & Monge, 1986).

Breaking down the multi-dimensional concept of "participation" into specific behaviors or actions in the organization is helpful in evaluating its effectiveness. In examining goal-setting at the workplace, Erez and her colleagues (Erez, Early & Hulin, 1985) presented a two-step model according to which goal participation increased goal acceptance, which in turn, increased the level

of performance. In an earlier theoretical work addressing the role of participation in goal-setting, it was argued that participation in goal-setting increases goal-acceptance by increasing individuals' feeling of control over the goal-setting process (Erez & Kanfer, 1983). Therefore, based on the evidence presented above, our preliminary assumption was that online crowd-deliberations, as a form of employees' participative process in decision making, will increase employees' commitment, trust, satisfaction and productivity. We also assumed that employees' participation will affect managers' behavior in the decision making process.

In the current paper we address a specific form of Participation in Decision Making (PDM) – participation through online crowd-deliberation. In the next section we will discuss the characteristics and implications of using the "wisdom of employees" in strategic/cultural online deliberations at the workplace.

Crowdsourcing in organizations

Social networks have changed the way we communicate and interact. In one simple click one can immediately contact large and unique network of friends and ask for their assistance or advice. Work implications did not take too long to evolve. One example is the concept of open code, which is an example of cooperation in the absence of direct monetary rewards and without conventional property rights (Weber, 2004). Forms of fragmented work, where workers are crowd-sourced through tools such as Amazon's Mechanical-Turk, allow for easy distribution of small tasks to a large number of workers located anywhere around the world (Ipeirotis, Provost & Wang, 2010).

The term "crowdsourcing" was coined by Jeff Howe in Wired Magazine in 2006 (Howe, 2006). Howe defined crowdsourcing as the act of taking a task traditionally performed by a designated agent (such as an employee or a contractor) and outsourcing it by making an open call to

an undefined but large group of people. Crowdsourcing allows the power of the crowd to accomplish tasks, which were once the province of just a specialized few (Howe, 2008).

Companies such as Google, Netflix and IBM offered cash prizes to those who come up with innovative business ideas or forecasts (Howe, 2008). Microsoft and Intel used crowdsourcing services, such as the "TopCoder" platform, to run contests for coding and identify new possible talent (Howe, 2008). While crowdsourcing is typically associated with the involvement of company external stakeholders in a value-creating process (Bayus, 2013), only recently it was acknowledged that this process may be used internally for the benefit of a company, by creating a participative setting for its employees (Li & Bernoff, 2011; Stieger, et al, 2012).

A Comparison of web based crowdsourcing versus more traditional methods of employee involvement shows that as opposed to traditional methods such as surveys, ideas contests, and focus groups, crowdsourcing constitutes all the following characteristics: outreach, information richness, remote collaboration, asynchronous collaboration, independence, additive aggregation, self-organization and joint access to collective intelligence (Stieger et al, 2012).

To the best of our knowledge, the first reported use of crowdsourcing internally by a large-scale company was done by IBM, back in 2001, when they initiated "Web-Jams" – an online massively parallel conference. Later, in an "Innovation Jam" initiated in 2006, 150,000 IBM employees, business partners, clients and family members participated in a couple 3-days sessions to identify innovative ideas for projects. Selected projects received \$100 Million in funding based on the Jam's results. The Jam's were defined as successful, but there were many challenges that appeared in that effort. One of them was related to the fact that ideas didn't just "bubble up". Organizers needed to push forward and manage the conversation with great efforts. Thousands of ideas were raised in the process of "harvesting ideas", and in order to put them together into a

coherent business concept they had to be organized in a constructive way – a process that was very challenging, laborious and time consuming (Bjelland & Wood, 2008).

The same forces that can use crowd-sourcing platforms for generating innovation can assist senior leadership and HR managers in acquiring a unique look inside the company with regards to the human factor. One such effort was conducted by IBM in 2003 to clarify IBM's values, while the company was going through an organizational change. Employees were invited to participate in the re-definition of the values (Bjelland & Wood, 2008).

Discussions on internal social networks often refer to topics such as work efficiency or knowledge management. They neglect the consequences of HRM or open strategy on the organization and fail to address the full complexity of their components (Hauptmann & Steger, 2013). The existing crowdsourcing systems are often purpose-built, supporting a set of specific, micro tasks in a particular domain and a specific part of the product lifecycle. There is a need for building crowdsourcing processes that can be used as a higher level, dynamic, task-based crowd teaming (Vukovic, 2009).

Knowledge management through internal social networks raises both opportunities and challenges for organizations. On the one hand, it provides open and inexpensive alternatives to traditional methods that facilitates knowledge sharing and open innovation. Social networks at work allow multi-vocal richness in communication and simultaneous co-production of content. However, on the other hand, social networks at work offer threats as well – the organization loses its ability to centrally manage the conversation and to control access to information. Communities may “develop a life of their own” which may raise challenges to management or knowledge protection (Brabhams, 2011; Von Krogh, 2012; Hauptmann & Steger, 2013; Huang, et al., 2013; Matzler, et al., 2014).

Research in the field of participative online methods of HRM is preliminary, but there is some evidence that while online employee participation tools are claimed to be "open", "social" and "participative", the actual experiences of employees suggests that employee participation was limited to certain discussions or political use by leaders and was no more "social" "open" or "participative" than traditional methods of participation (Denyer et al., 2011). While traditional methods of employee participation such as interviews or open forums are controllable by nature, in the social networks era new and open methods of employee participation emerge. HRM should not only embrace this change and accept its advantages (such as the ability to reach dispersed or/and large audience, and to increase transparency and trust) but also develop processes and practices to engage employees, facilitate the interaction and provide meaning to the employees feedbacks.

Traditional methods for upward communication, such as surveys, in-depth interviews, open forum, round tables and focus groups are currently used by HR professionals (Blackburn & Rosen, 1993; Vanzant-Stern, 2005; Flynn, 2010) for different purposes including organizational assessment (Table 1). The purpose of the study we describe here was to test the effectiveness of a new application of crowd-deliberations, aimed at tapping into challenges that are related to the human factor within the organization. We conducted the deliberations using a defined methodology known as Real Time Imen Delphi (RTID) for running and interpreting online crowd-deliberations.

Table 1. HRM methods of organizational sensing & upward communication.

	Employee Participation	Feedback	Constructed responses analysis technique	Deliberation length
Managerial DM forum	None	None	No	None
Survey/Suggestion box	Yes	1 way	Yes	Days/Weeks
In-Depth Interview	Yes	2 way	Yes	1-2 hours
Open Forum/Focus Group	Yes	Multi-Way	No	1-2 hours
Crowd-deliberation	Yes	Multi-Way	Yes	Days/Weeks

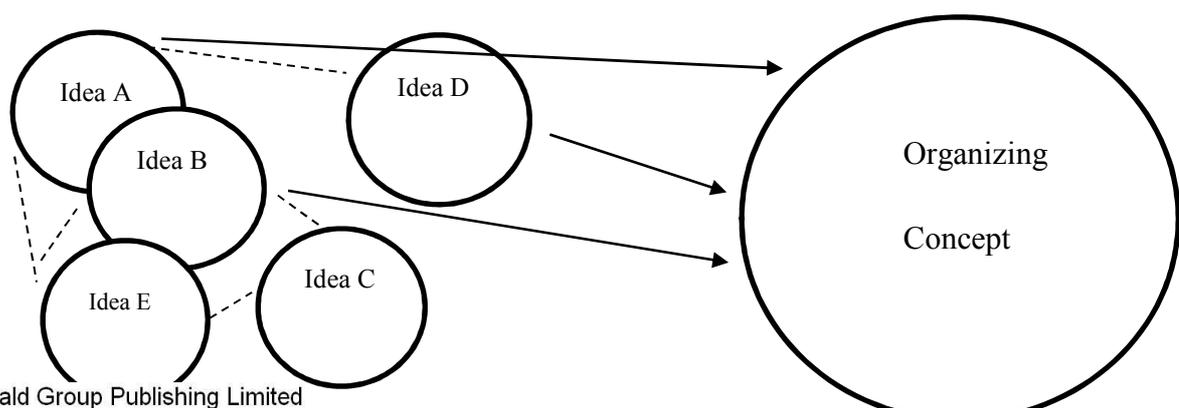
*DM= decision making. 1 way feedback is employee-to-manager, 2 way feedback is employee-to-manager and manager-to-employee, Multi-way feedback is employee-to-manager, manager-to-employee and employee-to-employee.

Such crowd-deliberations are in the interim between upward communication and innovation. Crowd-deliberation efforts can effectively target large numbers of employees, and last over days or weeks to allow for different layers of conversation to evolve. The communication is multi-way in that conversation is occurring not only between employees to managers, but it can also emerge among employees, so ideas presented by one employee are developed and refined by others.

Marginality and diversity are important factors that explain why deliberating employees' crowds have the potential to better work together than employees deliberating in traditional methods. Studies have found that being positioned in the lower corporate hierarchy and being spatially distance from corporate headquarters are associated with better corporate performance (Villarroel & Reis, 2010). Other studies also found that diverse population of randomly selected agents outperforms a team comprised of best performing agents (Hong & Page, 2004; Page, 2007; Page, 2008). By following a constructed method for facilitating and analyzing crowd-deliberations, the large amount of data can be analyzed consistently and effectively upon which management can reach conclusions and make decisions.

There are two major possible outcomes for organizational crowd-deliberations, in the practical and conceptual level (Figure 1). One practical outcome is the generation of a list of innovative ideas, which address the cultural problem or challenge raised. From this list, a board team composed of relevant managers or experts selects a final list of ideas for implementation. . Popularity of ideas (number of votes, comments, ratings) can serve as an indicator in the selection process. However, ideas are selected by the qualified decision makers at the organization based on the idea quality and feasibility. The second and most significant outcome of the organizational crowd deliberation is the identification of a main theme, which emerges from all the ideas and conversations. The theme, which is called "an organizing concept," connects together the vast majority of the ideas raised. An organizing concept is an underlying assumption, aspiration, and a reflection of the overarching problem or challenge that the participating crowd was able to generate. The organizing concept is ultimately summarized into one or two lines that capture the main essence of what the *crowd* was trying to say. The organizing concept is identified through content analysis of the statements: the identification of repeated words, themes, and ideas that appear across different categories and topics. Once identified, the organizing concept captures the essence of the issue and is highly useful for senior managers to be able to generate a wide understanding around the deliberated challenge.

Figure 1. Outcomes of HRM crowd deliberations: Practical ideas and an underlying organizing concept.





As in any other qualitative research procedure, various options for interpretation may exist and therefore several possible organizing concepts may emerge. The organizing concept should be presented to the participants and/or to other relevant individuals or teams from within the organization in order to verify its soundness and correspondence with the final list of mission statements. Only when participants accept the *organizing concept*, does the deliberation process end. At that point, the appropriate organizational teams should begin working towards putting the concept into action.

In this paper we report a case study of a crowd-deliberation we have conducted at Intel Corporation, through which we tested the efficiency of crowd-deliberations as an HRM tool for organizational strategy and cultural problem solving. In recent years, several online crowd-deliberations took place at Intel. Organizational questions such as the following were addressed: How can employees balance their 'work-life' better within a specific work environment? How can new recently hired senior managers integrate quickly to reach the best immediate impact? In this paper, we present an example of engaging employees in an online crowd-deliberation around a topic we called "The workplace of the future." This crowd deliberation was part of a broader project aiming to envision the future of work and to foresee future emerging workplace trends in order to proactively pave the way to get there (for a whitepaper released by Intel labs on the future of work see Hansen, 2013).

Employee crowd-deliberation

Models and settings of work are constantly changing and evolving (Abraham, 1990; Barley & Kunda, 2004; Cappelli & Keller, 2013). Therefore, there is a genuine organizational need to understand these changes and their implication on the workplace, and to prepare for them from a practical perspective. Large organizations are also attempting to create their own strategy for their future workplaces, as are governments. For example, PriceWaterhouseCoopers have initiated a survey of some 3000 new graduates from the US, China, and the UK who represent the millennial generation just joining the workforce, to explore their views and expectations about the future of work (Rendell, 2009). Similarly, in a joint project by Deloitte and Human Resources Professional Association in Canada (Greenhalgh & Moir, 2012), senior leaders from businesses, academia and governmental sectors were interviewed to create, based on scenario planning methodologies, scenarios and strategies for the future of the workplace in Canada.

These studies used methodologies based on interviews and surveys. Our study used a different approach to investigate these same questions. We aimed at tapping into the wisdom of crowds internally, as a constructed tool in order to determine Intel employees' vision for the work environment of the future.

Methodology

In order to tap into the wisdom of the employees who participated in this study, we applied a procedure that was found to be effective in cultivating the wisdom of crowds and specifically in envisioning collective preferable futures. The procedure is called the Imen-Delphi (ID) technique (Passig, 1997), and it is basically a variation of the classic Delphi forecasting technique. The classic survey-based Delphi studies are designed to predict the most probable trends about a variety of future issues through iterative rounds of votes among a group of experts. The Imen-Delphi (ID)

procedure, on the other hand, was designed to facilitate deliberations among a group of panelists who share a common future interest. The goal of the procedure is to help the participants clarify their opinions and expectations regarding their preferable and possible futures and thus to help them commit themselves to the task of implementing the desirable, agreed-upon future (Passig, 1998).

The classic Delphi technique is based on the assumption that group judgment of trends can enhance the validity of the forecast. The RAND Corporation developed the classical Delphi in the early 1950's in a project that was funded by the US Air Force. It was made public only a decade later. As Delphi has spread, many variants of the process have emerged out of the conventional procedure. Each variant aimed at improving the procedure in order to respond to needs and critiques (Linstone & Turoff, 1975; Woudenberg, 1991).

In contrast, the ID was based on the foundations of the Applied Social Systems Theories and relies upon the strengths of later versions of the Delphi technique. The ID, unlike other recent Systems based procedures for creating futures, was designed to develop shared future images among a group of people sharing a common future interest while using the same iterative feedback as the Delphi.

The ID main objective is to enable a group of panelists to establish a collective future mission and to efficiently cope with complex problems regarding their future. The ID procedure is geared to promote the responsibility and the self-awareness of the participants towards their probable and preferable future. The procedure, as opposed to the classical Delphi technique does not direct the participants to foresee future events. The procedure, instead, is designed to guide them towards general agreement and future growth. They are directed to reach one of the following five types of agreement: total agreements, majority, bipolarity, partial agreement, or total disagreement (Passig & Sharbat, 2004).

Participants

A group of 145 Intel Israel employees took part in this structured crowd-deliberation RTID procedure. The 145 participants were gathered from the different branches, units, and departments of the organization. As diversity and marginality were identified as a critical factor in successful innovation processes (Page, 2008; Villarroel & Reis, 2010), the participating employees held a

variety of roles within the organization, and came from different levels of the organization and from different demographic backgrounds (Table 2).

Branch	N	Males	Females	Average Age
Research & Development	69	50	19	34.6
Manufacturing	40	27	13	36.1
Human Resources	23	4	19	35.5
Corporate Services	6	4	2	37.3
Information Technology	5	4	1	34.9
Sales & Marketing	1	1	-	30.5
Legal	1	-	1	48.1
Total	145	90	55	35.3

Table 2. Demographics of the participants.

The participants were identified and approached based on an assessment of their interest in the topic and potential contribution to the process. The occupations of the participants reflected the variety of roles and careers that exist in the organization. It is important to note that during the deliberations, participants' anonymity was maintained; so that each participant's specific contribution remained undisclosed. All participants gave their initial consent to take part in the crowd-deliberation beyond their ongoing professional obligations.

Procedure

The Real-Time-Imen-Delphi (RTID), like the classic Delphi procedure, consists of four iterations, all of which were facilitated in this study by the researchers. The four iterations are: 1. question formulation, 2. suggested mission statement composition, 3. mission statement evaluation (rating), and 4. proposal of implementable ideas. Before implementing these four stages, there is a preliminary phase during which participants are exposed to background materials aimed at triggering the question formulation phase. The procedure was conducted in an online platform and interface designed specifically for facilitating these four iterations in one simple and cohesive online environment.

First iteration: Question formulation

The purpose of the first iteration, in which the participants were asked to formulate questions, was to collectively develop a database of sophisticated questions, queries, concerns, and perplexities that would be able to compel the participants to engage in deep discussions, through which they would express their collective inner preferable images about the future of their workplace. Participants were instructed to articulate as many questions as possible, while refraining from engaging in discussion about potential answers. At this stage, the participants were able to generate 689 questions which we had to consolidate into 90 well-organized questions that were introduced to the participants in the second iteration for deliberation, eliminating repetitions and consolidating the scope of issues that emerged from the queries and concerns (Figure 2).

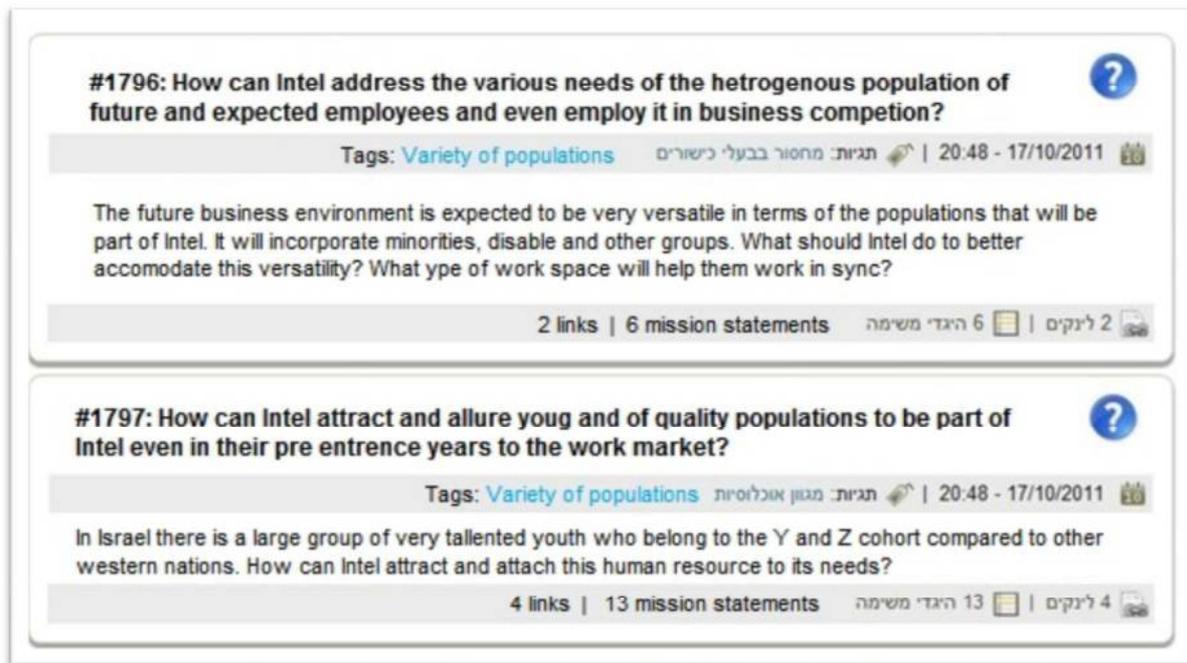


Figure 2. A sample of questions generated at the first iteration of the RTID that graduated to the second iteration

Second iteration: Mission statement composition

The purpose of the second iteration was to facilitate open and structured deliberations among the participants. It aimed to generate particular ideas and statements that the group or the organization could, in turn, implement in order to promote the workplace of the future. During this stage, participants were asked to answer the questions briefly, in the form of a mission statement (e.g.: *The organization ought to; The company needs to*). In addition, participants were instructed to comment on their colleagues' suggested mission statements, and define their comment as *pro*, *con*, or *neutral*. The underlying purpose of the comments was to reach the best possible mission statements, those that would reflect the aspirations of the entire group for the future of their workspace (Figure 3).

The screenshot displays a web-based interface for a crowd deliberation session. At the top, a lightbulb icon is next to the title: "#2722: Intel should implement a culture that enables work-life effectiveness to retain its employees for the long term". Below the title are navigation links: "word", "register", "next", and "back". On the right, it says "Participant # 192".

Below the title, there are tags: "Intel culture" and "תחנת תרבות אינטל". The date and time are "11:57 - 22/12/2011".

The main text of the mission statement reads: "The technology that facilitates work anywhere/anytime and the global needs to work in times that were supposed to be for family life, are taking a high toll on personal life. It is a burden that impossible to tolerate in the long run. The employee needs to pay attention to its toll and alarm the employer when the balance is off. The organization needs to legitimize the reporting of such imbalances, listen and address these concerns."

Underneath the mission statement is a section titled "Linked materials" containing a question: "Q # 2133: In times of global access anytime/anywhere, how can an organization develop a culture that separates work from home and personal life?". There are links for "Delete question" and "Add an applicable idea".

The "Deliberations" section shows three comments:

- Comment 1: "שלח ע"י משתתף 495 ביום ש', 14/01/2012 - 23:42 (בעד) היגד אדיר! בהרמאה של פסיג הוא דיבר על החירות - הנה דוגמא מצוינת - ברגע שהיו כללים ברורים של מה היא הפרת החירות תהיה רבה יותר, היום כשיש אפשרות לעבוד מכל מקום התפתחה ציפיה שנעבוד מכל מקום ותמיד ולא מכל מקום במגבלות יום עבודה נורמלי. כבר היום ישנם מהנדסים שלא מאננים לעבוד באינטל לא בשל היתרה ארגון לא מאתגר טכנולוגית אלא בשל התנאים של איזון בית עבודה."
- Comment 2: "שלח ע"י משתתף 481 ביום ה', 05/01/2012 - 21:16 (בעד) היגד מאוד חשוב, בייחוד היום. עובדים שלא יזלו ליצר את האיזון. ישחקו לאורך זמן ולבסוף יעזבו או שבציעים יהיו פחות טובים."
- Comment 3: "שלח ע"י משתתף 405 ביום ג', 03/01/2012 - 13:00 (בעד) חברה המסייעת לאיזון בית עבודה משפרת את עובדיה לטוב ארוך."

Figure 3. An example of a suggested mission statement and the deliberations that followed it.

Third iteration: Mission statement evaluation (rating)

The rating process of the mission statements, in the third iteration, was meant to provide the participants with a way to promote the ideas they supported. The rating process enabled them to focus the deliberations around what the group regarded as the most important, most expected, and most preferred futures for the workplace. They were asked to rate the statements according to three criteria: their *importance*, *priority*, and *likelihood of implementation*.

Fourth iteration: generating implantable ideas

At the end of the rating stage, we compiled a short list of top-rated suggested mission statements, based on percentage of proponents. From this list we then extracted the "organizing concept" – an underlying assumption, aspiration, and preferable vision that this crowd was able to generate. In the following chapter we discuss the results of each iteration and explain how the RTID procedure helped us understand the participants' preferred future of their workspace.

Results**First iteration**

The first iteration, which took place over the course of three weeks, enabled the participants to produce 689 initial questions. The participants were required to assign each question to one of five categories, reflecting the categories identified in the background & learning materials which was available to the participants prior to the first iteration of the crowd-deliberation as a database in the platform. These categories were: *demographics*, *technology*, *work environment*, *organizational procedures*, *culture & values* and *other*. At the end of this iteration, the 689 questions were consolidated into a shorter list of 90 questions, which reflected the combined and most relevant questions raised by the participants.

Second iteration

In the second iteration, which took place over the course of six weeks, the participants were able to produce 624 mission statements and 869 comments based on the 90 questions generated by the first iteration. As in the initial stage of question formulation, the participants were asked to assign each statement to one of the five categories for the future of work.

In the second iteration too, prior to launching the third iteration, we produced a short list of 258 suggested mission statements, by clarifying and combining the most relevant statements raised by the participants. Here too, we assigned each mission statement to one of the above five categories (Table 3).

Category	Sub-category	# of statements
Demographics	Diversity	22
	Lack of skills	8
	Globalization	7
	Knowledge and skill sets	4
	Local environment	2
Total		43
Technology	Technology Trends	19
	Computing	13
	Market Trends	10
Total		42
Work Environment	Organizational workspace	18
	Space, security, and privacy	11
	Physical work environment	7
	Virtual work environment	7
Total		43
Organizational processes	Hiring, training and retention	41
	Encouraging innovation	12
	Measurement and evaluation	12
	Collaboration	10
	Communication	9
	Work models	8
Total		92

	Social responsibility	15
	Culture change	14
Culture & Values	New values	5
	Branding and marketing	4
		38
Total		258

Table 3. The 258 mission statements by sub-category

Third iteration

In the third iteration, which took place over the course of three weeks and was open to a wider group of ~8000 Intel Israel employees, the participants were able to produce 5,650 ratings and 881 comments about these 258 mission statements. The participants were asked to rank each statement on a scale of 4 levels (from *low* to *high* – Figure 4) across three dimensions: How *important* and *preferred* the statement is for the organization; what the *priority* level for implementing the statement in the organization is; and the *likelihood* that the statement will be implemented, according to their best estimate and during the next decade. The following statements (Table 4) were the top ten statements that received the highest scores as the most important and preferred for the future workplace in Intel.

Statement	Importance/Preference to the Organization	Priority of Implementation	Likelihood of implementation
Intel should brand itself as a company that takes care of its employees in the best manner possible in order to attract new employees and retain the current ones.	3.72	3.65	3.54
Intel should brand itself as a leading company in technology and as operating in new and attractive market segments in order to attract new talent.	3.59	3.48	3.22
Intel should implement a culture that enables work-life effectiveness to retain its employees for the long term.	3.53	3.72	2.99
Intel should brand itself as a company that allows mobility across and between departments and fields in order to attract employees who are interested in diverse careers.	3.49	3.54	3.07
Intel should promote managers with high	3.47	3.60	2.78

levels of emotional intelligence, and not only technical capabilities. This will increase employees' motivation.

Intel should reward innovative and creative employees by providing them with special bonuses or research budgets to encourage innovation and creativity.	3.44	3.39	3.01
Intel should offer its employees maximal flexibility in hours and amount of work in order to enable normal family life.	3.38	3.39	2.77
Intel should equip employees with its latest pilot products under development in order to advance its workspace, which can also act as a marketing strategy for families and friends.	3.36	3.48	3.05
Intel Israel should retain and develop the unique attributes of its site in order to create an advantage as compared to other sites around the world.	3.34	3.28	3.10
Intel should hire employees who specialize in customers and user experience in order to create attractive products.	3.33	3.21	2.91

Table 4: Top ten most preferred/important mission statements.

At the end of this iteration, we produced a final list of 114 mission statements that clearly indicated that the majority (50% and more) of the participants would like to see as the leading, important, and most preferred future mission statements for their organization. The final statements were organized under themes (Table 5) to better clarify the concepts that underlie them.

Theme	Number of statements raised by participants as most preferred
Innovation and creativity	22
Computers and systems	16
Corporate social responsibility	15
Diversity	15
Employee development	13
Talent acquisition	12
Employee involvement	11
Management and leadership	10
Total	114

Table 5. The final list of mission statements by theme.

This list was then presented to the participants, who were asked to generate implementable ideas that are practical ways for promoting the agreed-upon statements and visions (Table 6).

Innovation and creativity	Provide employees with time to work on personal projects/innovations; Allow employees participate in innovation and future planning; allow employees to list patents on their names; reward employees for innovation;
Computers and systems	Implement systems supporting virtual work for individuals and teams from anywhere, at any time; knowledge-sharing applications; use robots for hazardous work
Corporate & social responsibility	Clean energy and recycling; open "green" jobs/roles for employees; Allow work-life balance and flexible employment models; maintain relations with employees' families,
Diversity	Hire multidisciplinary employees (who have knowledge and experience in several fields), put focus on diversity (hiring and developing): gender, maturity, and ethnicity.
Talent Acquisition	Put focus on flexible work models for diverse populations, encourage multi-generations at work (including youth and 50+ employees); Allow new models of work, project based work, "open" (like open code) work, part-time work and more.
Development	Identify pivotal talent and develop it, enrich current positions, reward managers for employee development, encourage sabbatical for academic studies, develop different kinds of developments paths.
Employee involvement	Create systems and platforms that encourage knowledge sharing and communication; involve employees in pilots of Intel products; encourage employees' ideation; encourage speed in decision making and involve employees in decision-making processes.
Management and leadership	Virtual management – manage from afar; increase employee access to communicating with senior managers; conduct surveys to get employee feedback on managers.

Table 6. A sample of implementable ideas

Fourth iteration

Next, we moved from the details, to make sense of the whole. We came up with an *organizing concept* that stemmed from the list of the most important and preferred mission statements through qualitative analysis. This is what the RTID procedure was designed to achieve, an overarching theme that describes the underlying desire for direction and action, as expressed by the group throughout the whole deliberation process.

The organizing concept

In this crowd-deliberation, through the mission statements that gained the highest scores, participants raised their concern that the current work models and settings do not provide them with

enough room to bring the full range of their talents, knowledge, and interests into action in their daily jobs and assignments.

The largest category, which included 92 out of 258 statements, was *work processes*: human factor related processes such as talent nurturing, training and development, communication, employee evaluation and work models.

While the concept "workplace of the future" may cover a wide range of topics such as work infrastructures (buildings, office spaces and services) or work technology (Robots, Computers, tech-services), participants mostly focused on human related issues. Participating employees in this crowd-deliberation clearly highlighted one predominant topic: the *employee*.

Intel's employees shared the need for different way of organizing work. They envisioned a *mission-based*, instead of a *position-based* work setting. They raised the need for flexibility in using their talents and the aspiration for multi-disciplinary job postings within the organization. Ideas such as "*Allow mobility across and between departments and fields*" (idea 4 out of the top 10 ideas), Or "*Reward innovative and creative employees by providing them with special research budgets to encourage innovation and creativity*" (Idea 6 out of the top 10) Or "*Develop culture that enables work-life effectiveness to retain its employees for the long term*" (Idea 3 out of the top 10) clearly put the employee and his/her aspirations in the center.

Thus, the organizing concept that emerged and was validated by the participants of the deliberation was the following: "In the future, work environment and procedures should enable employees to fulfill their full potential and optimally utilize their talent and aspirations." Specifically, the collective deliberations raised the need of the future workplace to create *enablers* and open new *channels*, so that employees will be able to bring their abilities and aspirations into play in the best possible manner, both for their own benefit and for that of the organization.

The *enablers* that were identified were the following: *social responsibility, cutting-edge technologies, personalization, flexible work models, talent acquisition, and diversity*. The *channels* that were identified were the following: *Innovation and creativity, employee involvement and participation in day-to-day corporate decision making, leadership, and management development, employee development, and virtual and global work*. A summary of the organizing concept, channels and enablers can be found in table 7.

Organizing concept	In the future, work environment and procedures should enable employees to fulfill their full potential and optimally utilize their talent and aspirations.	
Enablers	<ul style="list-style-type: none"> • <i>Social responsibility</i> • <i>Cutting-edge technologies</i> • <i>Personalization</i> 	<ul style="list-style-type: none"> • <i>Flexible work models</i> • <i>Talent acquisition</i> • <i>Diversity</i>
Channels	<ul style="list-style-type: none"> • <i>Innovation and creativity</i> • <i>Employee involvement and participation in day-to-day corporate decision making</i> 	<ul style="list-style-type: none"> • <i>leadership, and management development</i> • <i>Employee development</i> • <i>Virtual and global work.</i>

Table 7. The organizing concept, channels & enablers identified at the fourth iteration.

Discussion

Internal organizational crowd-deliberations focusing on HRM topics are in the interim between upward communication and innovation. We have elaborated here on a new practice, using crowd-deliberations as a tool for analyzing and strategizing about cultural challenges within the organization. Our claim is that the combination of two factors, which come into play in crowd-deliberations: (a) *ideation* (b) *employee participation*, results in a powerful HRM tool for analyzing and addressing cultural organizational problems. This methodology can complement or replace existing HRM methodologies for upward communication or organizational assessment (Table 1). The reliance on employees as the best source for information on internal cultural aspects is a known practice in HRM. Methods such as interviews, round tables and survey are used by most

organizations (Blackburn & Rosen, 1993; Vanzant-Stern, 2005; Flynn, 2010). Today, corporations are using social networks to enhance connectivity and information sharing among their employees. However, technology developments enable employees to participate in a wider range of applications, which can draw their wisdom and insight to a greater extent.

Not all crowds are wise. According to Surowiecki (2005), there are four criteria's that separates wise crowds from irrational ones: (a) *Decentralization* – people are able to draw on local knowledge and able to specialize (and in this study the employees are the ones who have the best local knowledge of the organization). (b) *Independence* – people's opinions aren't determined by the opinions of those around them (and in that sense, allowing anonymous participation and allowing diverse sample of employees to participate in the crowd deliberation addresses this criteria). (c) *Diversity of opinions* – each person should have private opinion even if it's just an interpretation of the facts (Here again, a diverse group of employees is the best source of information about the organization). And most importantly (d) *Aggregation* – some mechanism exists for turning private judgments into a collective insight (and here we followed the RTID procedure which is a grounded technique for crowd-deliberations management (Passig, 2004).

Another relevant theoretical framework of crowds' deliberations emphasizes the importance of diversity (Hong & Page, 2004; Page, 2007). Page's (2008) framework of problem-solving suggests that a diversified population of randomly selected agents outperforms a team comprised of best performing agents. Internally, within the organization, Page (2007, 2008) demonstrates how diversity provides a foundation to improved performance. Diverse agents have the advantage of 'supper additivity'. They have better prediction ability and can hinder a better decision making ability (Page, 2007, 2008). According to Page, organizations can and should use the power of cognitive diversity.

We described here an effort to meaningfully engage a diverse group of employees of a global high-tech organization in an online crowd-deliberation, aimed at identifying their vision for a preferable future workplace. Based on the deliberations in this case-study, the vision for a preferred future of work is not about an advanced technological environment where robots and machines make human life easier. Rather, we found that the preferred future of work place, as imagined by the employees who took part in the deliberation, is about fulfilling their full professional potential, both hidden and known.

As work arrangements in the new-economy vary and alternative settings or "non-standard work" (everything but regular full-time employment) become widespread (Cappelli & Keller, 2013; Smith, 1997), an inside look, internally, into the company, reveals that full time employees would like to apply attributes of flexible/contract work within their full-time work setting. The aspiration expressed by the employees in this crowd-deliberation process is for dynamic and agile team structures to become the norm and for the default mode of employment to look more like a gun for hire (contractor) than employment structures of the past (Hansen, 2012).

Employees would like to see a more flexible work hierarchy, where employees can make the best of their full range of capabilities, beyond the scope of a single role, and fulfill their potential, knowing that the organization will gain from doing so.

The group of employees that took part in this study clearly leaned towards the fractal model for their work environment (Hoverstadt, 2009). This model includes employees who will no longer have a single job description, but rather repeatedly sign up for tasks and projects based on their interests, capabilities, availability, aspirations, and future beliefs regarding the path their organization needs to take in manufacturing, research and development (Sandkuhl & Kirikova, 2011).

Some HR professionals have been discussing a similar idea of internal *talent markets*, where employees are matched to projects according to their skills and interests, and not necessarily in accordance with their official credentials (Cappelli, 2000; Bryan, Joyce & Weiss, 2006). In this study, however, we have seen that, although the participants were not familiar with the concept of fractal organization and the previous attempts by HR professionals to clarify the pros and cons of the concept for organizations, they were able not only to arrive at the concept independently, but were also clearly able to define it as their preferred future of work at Intel. Most importantly, they were able to list a variety of ideas how to successfully implement it.

Future research

The procedure presented here opens up important new venues for future studies investigating employees' participation, employees' innovation, HRM problem solving and upward communication methods. For instance, research is needed on the role of employee participation through crowdsourcing on employees' commitment, trust, satisfaction and productivity. Since not all forms of employees' participation were proven to be effective (Cotton, et al, 1988; Wagner, 1994; Miller and Monge, 1986) additional research on the effectiveness of crowdsourcing as a participative tool, should be conducted. This may be particularly interesting not only from the perspective of the employees, but also from the managers' perspective. In addition we found no study investigating the correlations between employee participation and managers' commitment to action. As online crowd-deliberation platforms document information which is accessible over time, we believe that such visibility will encourage management to act upon the selected challenge once the deliberation is over and the main actions and organizing theme are identified and agreed.

Practical implications and Conclusion

The result of this case study presented here provides an example of how organizations can harness their employees' wisdom to bring to the table cutting-edge ideas, debate their relevancy to the organization, agree collectively on their vision for the future and generate applicable ideas towards realizing their preferred future image.

The Real-Time-Imen-Delphi (RTID) procedure was designed to harness in an orderly manner the wisdom of groups in developing a desired future by engaging a group of stakeholders to deliberate anonymously online the issue at hand (Passig, 2004). This study joins others that demonstrated that well organized deliberations, based on an established procedure, could assist a group of stakeholders in generating agreed upon ideas aimed at solving a given dilemma. The specific dilemma in this study was how the organization prepares itself for the future workplace given the changes in workplaces environment which affects it.

There are additional crowd-sourcing methods that support ideation, whose application provides benefits for business organizations. For example, Prediction Markets is becoming increasingly popular in using crowd wisdom to directly guide decision-making in businesses and manufacturing processes (Luckner 2008). The Futures Wheel procedure is another method designed to identify complex consequences of trends and events. Stakeholders use it to identify potential problems and opportunities, new markets, products, and services (Glenn & Gordon, 2003). Yet another methodology is "Idea Management," which is a structured process that supports soliciting ideas from employees, evaluating them, and assessing the potential value of implementation (Baumgartner, 2008).

As social media tools and deliberation platforms evolve and become a central part of our lives, organizations will seek to involve employees in major conversations and in decision-making processes. RTID is a solid way in which to do this, as demonstrated in previous studies (Passig,

2004) and in this study as well. As one employee described it: "In the future, organizations will be a place where the individual employee will have a chance to influence, make a change, and leave his or her own mark". At the end, as social networks evolve, organizations will need to accumulate sound procedures for upward communication through social networks that can be run in little time or real time, involve large numbers of participants and rely on just a small number of manpower resources. The RTID could be part of such a tool box.

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Biographical Details:

David Passig, PhD, is an associate professor at Bar-Ilan University (BIU), Ramat-Gan, Israel, where he teaches at the Graduate School of Education. His courses include: Systems Theories, Future Methodologies, and Technological, Social and Educational Futures. He heads the Graduate Program in Communication Technologies as well as the Virtual Reality Laboratory. He has consulted for many corporations as well as public and private sector institutions. He has served as the chief advisor to the Commissioner for Future Generations in the Israeli Knesset. He is a member of the Israeli National Council for R&D.

Nirit Cohen is the Intel Israel HR Director. With Intel over 20 years in various positions in Finance, Human Resources and Mergers & Acquisitions including roles with Corporate, in the US, Greater Europe and Israel. Nirit teaches at the Executive MA for HR managers in Tel-Aviv University. Nirit holds an MA in Technology Policy & Innovation Management from the Maastricht Economic Research Institute of Technology at the University of Limburg, Netherlands.

Email: nirit.cohen@intel.com

Liad Bareket, PhD, is a program manager at the Human Resources department at Intel. Her research is focusing on emotional and interpersonal consequences of online communication.

Email: liad.bareket@intel.com

Ofer Morgenstern is a PhD candidate in the Graduate Program in ICT and ED, Bar Ilan University, Israel. His research focuses on the user interface of crowd wisdom applications.

Email: ofermorgen@gmail.com