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Assessing the Maturity of Crowdfunding for Corporate Entrepreneurship

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Abstract: Corporate entrepreneurship is a process of strategic renewal and development of an existing business through the creation of new products, services and activities, as well as new competitive postures and independent ventures. The performance of this process, which leverages the creativity and the spirit of initiative of employees and managers, is thus relying on the capacity of the organization to create favorable conditions for the emergence of such latent entrepreneurial potential. The development of participatory innovation models and collective intelligence offer new insights for conducting research on factors enabling corporate entrepreneurship. In particular, the internal company “crowd” can be investigated with the purpose to study the conditions under which the corporate entrepreneurship process can be successfully nurtured and conducted. In such view, this article moves from an extended review on corporate entrepreneurship and organizational innovation literature to define the concept of “crowdfunding” and to present an assessment tool aimed to evaluate the maturity of the crowdfunding process within an organization. The tool, which captures both individual and organization-related factors, is also used for an illustrative application into a multinational IT company. Some implications at theory and practitioner levels are also drawn.

Keywords: Assessment Tool; Collective Intelligence; Corporate Entrepreneurship; Crowdfunding; Maturity.

1. CORPORATE ENTREPRENEURSHIP: QUO VADIS?

Corporate entrepreneurship (CE) is an all-encompassing concept that indicates the process of strategic renewal of existing business (Zahra, 1991), as well as the creation of new ventures, products or services, or new strategic postures driving organizational innovation (Antoncic & Hisrich, 2004; Antoncic & Prodan, 2008). The construct is multi-faceted and includes several dimensions such as innovation, corporate venturing, intrapreneurship, strategic renewal, and industry rule breaking (Guth & Ginsberg, 1990; Hanan, 1976; Hornsby et al., 2002; Kuratko et al., 1990; Kuratko et al., 2009; Thornberry, 2001; Vesper, 1984; Zahra & Covin, 1995). As a company process, CE is strongly associated to increased financial performance measured in terms of profitability, market share and growth (Lumpkin & Dess, 1996; Zahra, 1991; Zahra & Covin, 1995), with success cases such as Apple, 3M, Procter & Gamble, Google, and Philips (Ford et al., 2010; Kuratko et al., 2014).

The relevance of the topic has attracted a considerable interest of researchers, particularly for the analysis of the factors that may enable (or hinder) the successful undertaking of entrepreneurship processes within organizations. The CEAI (*Corporate Entrepreneurship Assessment Instrument*) (Hornsby et al., 2002; Hornsby et al., 2008) was introduced to focus on antecedents like management support, work discretion/autonomy, rewards/reinforcement systems, time availability, and organizational boundaries. Ireland et al. (2006a, 2006b) presented the “*Entrepreneurial Health Audit*”, a tool for assessing the firm’s entrepreneurial intensity and identifying the characteristics that may support or hinder the internal entrepreneurial process. The entrepreneurial intensity is described in terms of degree (innovativeness, risk-taking and proactiveness) and frequency (new products, services or processes), whereas the organizational characteristics is evaluated using the “*Corporate Entrepreneurship Climate Instrument*” (similar to the CEAI).

Later, Ireland et al. (2009) proposed a model including the antecedents of CE (individual entrepreneurial cognitions and external conditions), the founding elements (entrepreneurial vision of top management and organizational conditions), and the expected outcomes (competitive capability and strategic repositioning). Morris et al. (2009) identified four building blocks for the design of supportive work environments, i.e. culture, structure, resource controls, and human resources management.

Kelly (2011) presented the “*Evolve and Connect*” model based on three key elements (entrepreneurial process tools, entrepreneurial strategy, and entrepreneurial structure) to improve the entrepreneurial capabilities of the firm. Soleimani & Shahnazari (2013) validated a research model based on four groups of factors supporting CE, i.e. personal characteristics of entrepreneurs (e.g. risk taking and result orientation), HRM practices (e.g. compensation strategies and job design), organizational culture (e.g. team spirit and empowerment), and employee satisfaction (e.g. relationships with colleagues and loyalty).

Based on Hornsby et al. (2002), Kuratko et al. (2014) proposed the CEAI (*Corporate Entrepreneurship Assessment Instrument*) to assess the antecedents of entrepreneurial behavior by focusing on the same elements proposed by Hornsby et al. (2002), i.e. management support, work discretion/autonomy, rewards/reinforcement systems, time availability, and organizational boundaries. Finally, Turner & Pennington III (2015) developed a new framework based on motivation, opportunity, and ability to demonstrate that knowledge sharing and organizational learning are necessary ingredients to drive corporate entrepreneurship.

An essential element discussed within most of such frameworks is the relevance of the HRM practices as important boosters of CE (Hayton, 2005; Mustafa et al., 2016; Özdemirci & Behram, 2014; Zhang & Jia, 2010). In particular, practices that are crucial to drive a successful corporate entrepreneurship process are performance appraisal, management support, use of rewards, orientation and training, job design, resource availability, encouragement to learning and cooperation, and a culture of individual risk taking (Hornsby et al., 1993; Jiang et al., 2012; Morris & Jones, 1993).

In addition, HRM may stimulate the employees' entrepreneurial attitudes and behaviors by supporting cooperation, motivation, commitment, and learning (Kaya, 2006; Kuratko et al., 1990; Montoro-Sánchez & Ribeiro Soriano, 2011; Rutherford & Holt, 2007; Schmelter et al., 2010; Schuler, 1986; Zhang et al., 2008).

HRM practices are also associated to an increased employee creativity (Jiang et al., 2012) since they can reduce the sense of uncertainty and stress of individuals, thus leading to a sense of psychological availability (Binyamin & Carmeli, 2010). Creativity is a key ingredient of the entrepreneurial process; it refers to the generation or production of ideas that are both novel and useful (Amabile, 1988), and it can occur at individual, team or combined level (Anderson et al., 2014). Many studies investigated the enabling factors of creativity, which include learning and goal orientation (Hirst et al., 2009), job complexity (Shalley et al., 2009), emotional ambivalence (Fong, 2006), intrinsic motivation (Shalley et al., 2004), extrinsic motivation (Amabile et al., 1996), and team composition (Somech & Drach-Zahavy, 2013).

Whereas the role of human resource management and employee creativity to drive successful CE was clearly recognized, the study of enabling factors at individual and organizational level can benefit nowadays from the application of findings in the field of Collective Intelligence. In its broadest sense, collective intelligence refers to the capacity of a human community to face complexity, problem solving and innovation through extended collaboration and integration (Lévy, 2010; Malone et al. 2009; Malone et al., 2010; Pór, 1995; Pòr, 2008).

In the business context, collective intelligence approaches can foster participative forms of collaboration, support innovative business modeling (Tauscher, 2016) and collective entrepreneurship (dos Santos & Spann, 2011; Ribeiro-Soriano & Urbano, 2010). The main factors required for a group to practice collective intelligence are *diversity* of members (in terms of knowledge and abilities) and their *independence*, a dense *communication structure*, informal *learning processes*, intergroup *competition*, a system of *incentives*, and *management* encouragement and support (Bloom, 2001; Girgensohn & Lee, 2002; Lee et al., 2001; Surowiecki, 2004).

A specific example of collective intelligence is Crowdsourcing (Buecheler et al., 2010a; Doan et al., 2011; Estellés-Arolas & González-Ladrón-de-Guevara, 2012; Prpić et al., 2015), which can be adopted to support company operations as well as the development of entrepreneurial actions (Laubacher, 2012), and particularly idea screening and selection (e.g. Quirky or Springwise), or project funding (e.g. Indiegogo, Kickstarter, and ProFounder).

It is thus of interest to understand how and under which conditions the internal "crowd" and collective intelligence of an organization can support the process of corporate entrepreneurship. In particular, the core factors at individual and organizational level should be investigated to determine the enabling conditions for CE to emerge as a distributed and participative effort. The next section presents a definition of *crowdventuring* and the results of an extended review of literature addressed to identify the core enablers of employee-driven entrepreneurship.

2. CROWDVENTURING: DEFINITION AND ENABLING FACTORS

Entrepreneurship processes within organizations are evolving towards more distributed and participative forms. Based on the concepts of corporate entrepreneurship, collective intelligence and crowdfunding, *crowdventuring* can be defined as a structured and systematic process aimed to leverage the distributed intelligence and creativity inside the organization (the *crowd*) to initiate and develop effective entrepreneurial activities bringing to new products, services, processes, and businesses (*venturing*).

In order to identify the key enabling factors of such employee-driven and participative entrepreneurship approaches, an extended review of literature was conducted through a structured process of document retrieval (Tranfield et al., 2003). A list of keywords was firstly defined using preliminary literature findings and included 6 terms capturing the main subject of the study, i.e. *corporate entrepreneurship*, *corporate venturing*, *intrapreneurship*, *organizational entrepreneurship*, *organizational innovation*, and *strategic renewal*. A second list of keywords was defined to capture the specific focus of the investigation as related to the main subject, i.e. *antecedent*, *collaborat**, *collective*, *creativity*, *crowd*, *enabler*, *environment*, *framework*, *human resource*, *model*, *practice*, and *process*.

A combined search (AND search) of primary and secondary keywords was thus conducted into article titles and abstracts contained into the *Scopus* database. As a result, 118 papers were found and isolated for further analysis in search of definitions, claims, classifications, findings and frameworks about corporate entrepreneurship drivers and enablers. Based on such analysis, an initial list of constructs (and related literature/author) was extracted from articles. A refinement work was thus addressed to eliminate duplicates and aggregate comparable items, thus leading to a final list of 44 elements associated to either individual or organization-related dimensions.

Individual-related elements include *soft* characteristics of employees (personal and psychological traits) and *hard* aspects (related to technical competencies and professional background), which were found to be positively linked to the emergence of entrepreneurial dynamics. Organization-related conditions include elements associated to the *psychology* of the company (the system of shared principles and values), and the *physiology* of the organization (mostly management practices), which were found to create the conditions for employee-driven entrepreneurship to emerge. The four groups of elements and the related literature are reported in Table 1 (individual factors) and Table 2 (organizational factors).

[Insert Table 1 about here]

[Insert Table 2 about here]

3. ASSESSING THE MATURITY OF CROWDVENTURING

3.1 The Crowdventuring Checklist

The performance of *crowdventuring* is related to the ability of the organization to nurture distributed employee contribution with the goal to develop new business ideas and translate them into new products, services or ventures. In order to understand if and at which extent an organization possesses such capacity, an examination of enabling factors is thus required. Building on the idea developed with the *CEAI* (Kuratko et al., 2014) of defining a diagnostic assessment tool for managers aiming to understand the internal environment, the research was addressed to develop a

maturity assessment checklist aimed at measuring the company capacity to support crowdventuring.

The checklist includes 50 Likert-style questions/statements built upon the list of factors reported in Tables 1 and 2. The full questionnaire developed, which represents the core tool for crowdventuring assessment, is reported in the Appendix. In particular, 11 questions/statements are addressed to measure psychological employee characteristics (e.g. *employees of your organization possess team-working, networking and social skills*), 6 are associated to professional employee characteristics (e.g. *employees in your organization possess entrepreneurial experience*), 15 items relate to the system of values of the company (e.g. *your organization promotes knowledge sharing and learning*), and 18 are related to management practices adopted within the company (e.g. *job rotation is normally applied into your organization*). A 1-5 scale can be used for answers, where 1 stays for “completely false” and 5 indicates “completely true”.

3.2 The Crowdventuring Matrix

The use of the assessment tool can provide valuable insights about the level of maturity achieved by individual and organizational enablers of crowdventuring. Such data can be also used to classify the organizational model or archetype in terms of strong or weak degree of employee-driven entrepreneurship.

One attempt to classify companies based on their approach to corporate entrepreneurship was realized by Wolcott & Lippitz (2007). The authors focused on two important dimensions (under the direct control of management) that differentiate how companies approach corporate entrepreneurship. The first dimension is “organizational ownership”, related to who within the company has primary title for the creation of new businesses, whereas the second is “resource authority”, related to the existence (or absence) of a dedicated corporate pool of money for such purpose. Together the two dimensions generate a matrix with four dominant models, i.e. “opportunist” (diffused ownership – ad hoc authority), “enabler” (diffused ownership – dedicated authority), “advocate” (focused ownership – ad hoc authority) and “producer” (focused ownership – dedicated authority).

Adopting a different perspective on enabling individual and organizational conditions rather than specific management dimensions, four possible “archetypes” can be identified based on the application of the crowdventuring assessment tool. Whereas the “best” scenario is represented by the case in which both organizational and individual enablers are strongly developed within the company, the “worst” scenario is where both organizational and individual conditions are lacking or underdeveloped. Two intermediate situations are those in which only individual conditions or only organizational conditions are favorable. Figure 1 shows the crowdventuring matrix with the four models or archetypes. The evaluation is based on a 1-5 Likert scale where low values are those considered significantly below 3 (which is a “neutral” value for the scale) and high values are those significantly above 3.

[Insert Figure 1 about here]

When the maturity of both individual and organizational factors is low, the organization is likely to be characterized by a *status quo* in terms of entrepreneurial development. Employees lack personal and/or professional attributes supporting entrepreneurship and the company is not able to create a favorable climate and ensure support to

bottom-up entrepreneurship processes. The model can be denominated *Entrepreneurship Vacuum*.

If both individual and organizational factors are high, the company has a relentless approach to entrepreneurial development. Competent and autonomous individuals are stimulated to propose creative ideas and innovative projects, which receive full management support and resources. The organizational climate is thus favorable for entrepreneurship and the company can be denominated *Crowdventuring Factory*.

If individual factors are low and organizational factors are high, the presence of favourable contextual and management conditions is not accompanied by the existence of entrepreneurial attitude and competencies within employees, who tend to stick to routine work and avoid risky and uncertain initiatives. This model can be denominated *Untapped Context*.

Finally, if individual factors are high and organizational factors are low, passionate and motivated employees with entrepreneurial spirit strive to develop innovative projects since the organization does not provide them with proper resources and facilities. Employees are open to risk but they are discouraged to carry on new initiatives since the organizational context is not appropriate for experimenting creativity and innovation. This model can be denominated *Left Alone Intrapreneur*.

4. CROWDVENTURING IN EXPRIVIA SPA

4.1 Case Background

In order to obtain a preliminary validation, the assessment tool was applied in a real case (Yin, 1994). The company investigated is Exprivia SpA, which operates into the software and consulting business, with a major focus on risk management, business analytics and big data, security/infrastructure monitoring, and enterprise resource planning. Its customers belong to different industries such as oil & gas, energy, defense, aerospace, government, health care, finance and insurance, telecommunications and media. In the last six years, the company (listed on the Italian Stock Exchange since 2000) achieved a 50% growth in terms of revenues (144 million euros at the end of 2015) and a 60% growth in terms of employees, with about 2100 people that are mainly located in Italy (with foreign branches in Spain, Mexico, Guatemala, Peru, Brazil and China). For 2015, the company ROI was 9%, the investments in R&D were 5% of turnover, and about 7% of employees were involved in R&D activities. Exprivia participates in many research consortia to carry out innovative projects in collaboration with companies, universities and research centers. The data collection procedure included two steps: 1) a structured questionnaire based on the crowdventuring checklist was submitted by e-mail to the general director of the R&D department; 2) two semi-structured and in-depth interviews with the general director of R&D and with a senior R&D project manager were conducted to collect more qualitative and detailed information. The twofold approach to data collection is coherent with the recommendation of Woodside & Wilson (2003) about case study research.

The focus on R&D was motivated by the fact that the research department is the internal area of reference for single employees and teams aiming to propose new ideas and innovative projects. Respondents were chosen for their longstanding industry experience and for a comprehensive view of both research and production aspects. The interviews were conducted through a conference call until a convergence of views was accomplished (Miles & Huberman, 1994). The interviews lasted about two hours and were tape-recorded to ensure the information's reliability (Bourgeois & Eisenhardt,

1988). Data collected have been also triangulated (Johnson, 1997) with public information about the company.

4.2 Findings

The study allowed to measure the level at which individual and organizational enablers of crowdventuring are developed within Exprivia. The numerical results deriving from the questionnaires were integrated with the content of interviews conducted with managers, which provided more qualitative arguments and explanations of findings obtained with the survey. Table 3 reports some highlights about factors assessed within the company.

[Insert Table 3 about here]

Concerning individual enablers, both personal and professional employee characteristics reported average values above 3 (namely 3.55 and 3.17). Aspects that are particularly positive, according to the questionnaire and the interviews with managers, are the willingness of employees to experiment and operate in network for achieving innovative results, and the presence of self-motivated and passionate people interested in market and industry trends. People with different background (mostly management, engineering and computer science) are also endowed with the scientific methods and the intuition needed to pursuit innovative goals.

Concerning organizational enablers, the “code of conduct” of the company in terms of innovation and entrepreneurship was measured above 3 (3.50 for the system of values and 3.65 for management practices). A point of specific strength is the autonomy/empowerment ensured to individuals willing to take creative and risky initiatives. The company promotes a sense of trust and encouragement for activating the “entrepreneurial journey” via the creation of dynamic teams that span different company functions and divisions to collaborate on creative ideas in emerging business and technology domains (e.g. big data, homeland security, defense and aerospace). Management practices and purposeful initiatives have also a specific relevance in stimulating employee-driven entrepreneurship in Exprivia. The interview with managers allowed to obtain information about some of these initiatives or programs, and particularly “Idea-Cards”, “R&D Impact”, “Open Mind”, “Smartnet”, “I-Learn”, and “Talent”.

The “Idea-cards” initiative encompasses a structured process, under direct and continuous management monitoring, aimed to collect creative inputs and ideas directly from the employees. An internal (ad-hoc) cross-unit committee evaluates ideas and selects the most promising ones based on technical feasibility and the “proximity” with the company business. Whereas the proponents of the best ideas receive a prize (e.g. a smartphone or tablet), the company management decides which idea has to be “transformed” into new products or services. A pre-allocated budget is available at such purpose. In the 2015 edition, three proposals were selected for market development, i.e. a mobile ticketing platform, a diabetes management system, and a big data solution for homeland security.

The “R&D impact” initiative aims at understanding how the results of the R&D projects can renew/revitalize the company processes and product portfolio. A shared repository is available for managers and employees involved in R&D activities to upload synthetic descriptions of research outcomes and prototypes generated. Each contributor can thus provide comments and suggest improvements, applicative scenarios, or future developments. In 2015, 8 entries were uploaded in the repository and generated 6

research projects submitted to public funding calls and 4 pilot projects presented to potential customers.

“Open Mind” aims to collect opinions and interests about artificial intelligence and the Internet of Things. The ultimate goal is to capture the perception of employees and to elaborate new conceptualizations of services, products, and technologies able to open new market niches. In 2015, two services were proposed and inspired the design of a new prototype that is currently in the implementation phase.

“Smartnet” is an initiative addressed to design a collaborative virtual environment to encourage knowledge sharing, collaboration, and continuous learning within Exprivia. The objective is to discover innovative ideas as well as creative and talented people, promote new collaborations, and identify external resources and partners with high potential.

“I-Learn” focuses on developing competencies of human resources working in both research and production activities. In 2015, the company organized 5 training programs involving more than 450 employees, 9 internal experts and 5 external mentors. The programs covered technical, management and innovation-related aspects.

Finally, the “Talent” program was launched to recruit brilliant profiles with background in business, social and basic sciences. In 2015, 3 new young talents were hired to work with experts and managers on new projects focused on big data, homeland security, defense and space. In such fields, skills like lateral thinking, innovation, creativity and problem solving are particularly crucial and are thus specifically looked for in candidate profiles.

Based on the results of questionnaire analysis and the interviews held with managers, it is possible to classify Exprivia as a *Crowdventuring Factory*. Both individual and organizational factors are high in the company (average values are significantly above 3, with 3.55, 3.17, 3.50 and 3.65), which has a positive attitude in terms of entrepreneurial development. Competent and autonomous individuals are stimulated to propose creative ideas and innovative projects, which receive proper management support and resources. The organizational climate is thus favorable for employee-driven entrepreneurship to emerge and be successfully conducted.

5. FINAL THOUGHTS

The study of collective intelligence to create new business value is a relatively new but extremely impactful research trend. Crowd-based business models are able to lead to an important competitive advantage although they simultaneously present new challenges for managers associated to determining which is the real value of the crowd to the organization, how to create value for the crowd, and how to capture value from the crowd effectively (Tauscher, 2016).

Corporate entrepreneurship is a strategic company process, which is particularly impacted by the emergence of collective and distributed rather than centralized approaches. Organizations are today required to create the most favorable conditions to nurture the entrepreneurial potential of their employees and managers. Based on an extended literature review, this article introduced the concept of “crowdventuring” as a systematic process of leveraging the distributed “in-house” creativity of employees and managers to develop effective entrepreneurial activities. The article has also proposed and applied an instrument to assess the maturity of the crowdventuring process within and organization and a matrix with the definition of four organizational archetypes.

The creation of a *Crowdventuring Factory* requires the existence of a number of enabling elements placed at individual and organization level. In order to capture the most of value from the company crowd (employees and managers), key practices and tactics range from identifying the crowd members' motivation, developing crowd members' capabilities, creating complementarities between contributions, fostering entrepreneurial behavior, and lock in high-value crowd members (Tauscher, 2016).

Actually, these guidelines can be considered as enabling conditions to frame crowdventuring as an application of collective intelligence. Indeed, by referring to the six constituting key pillars of a collective intelligence system (Boder, 2006; Bonabeau, 2009), it is possible to interpret the enhancement of the entrepreneurial potential of the organization as the main objective to reach (first pillar), whereas the presence of creative employees with their personal and professional characteristics as the competent actors (second pillar). Moreover, prototypes, technological infrastructures, strategic plans, and tacit knowledge represent the resource component (third pillar), whereas the initiatives aimed at discovering innovative ideas proposed directly by the employees (Ebner et al., 2009) may represent the physical and virtual interaction mechanisms (fourth pillar). By continuing, the system of values adopted to create the right conditions under which teams can perform better than groups of experts may represent the culture and norms component (fifth pillar). Finally, the methods and tools specifically adopted in each organizational management practices may support precisely the assessment strategy (sixth pillar).

Some implications and avenues for future activities can be identified at theory and practitioner level. By a theoretical viewpoint, the application of the assessment tool with a larger number of organizations can allow to obtain a more robust validation of the instrument and indications about the usability and reliability of the checklist proposed. From a practitioner perspective, the crowdventuring assessment method and tool can be adopted by managers as a checklist for self-assessing the company climate and designing better individual and organizational conditions and mechanisms to support the CE process.

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Table 1: Individual-related elements

Personal and psychological factors	Literature
Creativity, capability to propose innovative ideas/solutions	<i>Hayton & Kelly, 2006</i>
Discovering and experimentation	<i>Dyer et al. 2008; Edwards-Schachter et al., 2015</i>
Flexibility against changes, tolerance with ambiguity, comfort with complexity, challenging work	<i>Dul & Ceylan, 2014; Soleimani et al., 2013</i>
Independence, autonomy	<i>Dul & Ceylan, 2014; Hornsby et al., 2002; Surowiecki, 2004</i>
Observation	<i>Dyer et al. 2008</i>
Positive influence	<i>Hayton & Kelly, 2006</i>
Risk-taking	<i>Hayton & Kelly, 2006; Soleimani et al., 2013</i>
Self-motivation, self-confidence, self-efficacy, desire of achievement, goal-orientation	<i>Ahlin et al., 2014; Hayton & Kelly, 2006; Soleimani et al., 2013</i>
Social skills, team-working, networking	<i>Dul & Ceylan, 2014; Dyer et al., 2008; Hayton & Kelly, 2006</i>
Tenacity, passion for work	<i>Hayton & Kelly, 2006</i>
Willing to assume responsibilities	<i>Soleimani et al., 2013</i>
Technical and professional factors	Literature
Analytical thinking, imagination, intuition	<i>Piffer, 2012</i>
Education levels	<i>Harris & Gibson, 2008; Madsen et al., 2003</i>
Entrepreneurial experiences	<i>Harris & Gibson, 2008</i>
Multidisciplinary knowledge background	<i>Hayton & Kelly, 2006</i>
Technical knowledge and social skills	<i>Hayton & Kelly, 2006</i>
Use of experimentations and scientific methods	<i>Dyer et al., 2008</i>

Table 2: Organization-related elements

Principles and system of values	Literature
Autonomy, delegation, empowerment, tolerance to failures	<i>Ahmad et al., 2012; Dul & Ceylan, 2014; Kuratko et al., 2014; Srivastava & Agrawal, 2010</i>
Collaboration and team-working	<i>dos Santos & Spann, 2011; Kaya, 2006; Soleimani et al., 2013</i>
(Dense) communication and networking	<i>Girgensohn & Lee, 2002; Lee et al., 2001; Rutherford & Holt, 2007; Soleimani et al., 2013</i>
Creativity, problem solving, ideation and innovation	<i>Dul & Ceylan, 2014; Kaya, 2006; Schmelter, 2010; van der Hoog & Saly, 2001</i>
Diversity of backgrounds, knowledge and abilities	<i>Amabile and Khaire, 2008; Surowiecki, 2004; Zahra et al., 1999</i>
Job satisfaction	<i>Comeche & Loras, 2010</i>
Knowledge sharing and (informal and unstructured) learning	<i>Lee et al., 2001; Martín-Rojas et al., 2013; McGrath et al., 1994; Surowiecki, 2004</i>
Participative leadership and decision making	<i>Ahmad et al., 2012</i>
Rewarding and career development based on entrepreneurial results	<i>van der Hoog & Saly, 2001</i>
Risk-taking, achievement of ambitious goals	<i>van der Hoog & Saly, 2001</i>
Trust and loyalty	<i>Welter, 2012</i>
Management practices	Literature
Availability of free time	<i>Dul & Ceylan, 2014; Kuratko et al., 2014; Rutherford & Holt, 2007</i>
Career promotion based on successful development of innovative ideas	<i>Kuratko et al., 2014</i>
Cooperation and knowledge sharing among departments	<i>dos Santos & Spann, 2011; Kuratko et al., 2014</i>
Cooperation with external partners	<i>Chesbrough, 2003</i>
Exploitation of new ideas, technologies and prototypes, and protection of intellectual property assets	<i>Eckhard & Shane, 2003; Lumpkin & Dess, 1996; Shane & Venkataraman, 2000; Schmelter et al., 2010</i>
Hiring people with entrepreneurial characteristics	<i>Schmelter, 2010</i>
Job rotation	<i>Dul & Ceylan, 2014</i>
Management support and encouragement to propose improvement, new ideas and entrepreneurial projects	<i>Bloom, 2001; Dul & Ceylan, 2014; Hornsby et al., 2002; Kuratko et al., 1990; Kuratko et al., 2014; Rutherford & Holt, 2007</i>
Organization of initiatives to stimulate intergroup competition, entrepreneurial behaviors and competencies	<i>Bloom, 2001; Harris & Gibson, 2008; Kuratko, 2005; Surowiecki, 2004</i>
Presence of dedicated funds	<i>Kuratko et al., 2014; Wolcott & Lippitz, 2007</i>
Presence of dedicated support and formalized procedures	<i>Wolcott & Lippitz, 2007</i>
Provisioning of dedicated spaces and tools	<i>Hornsby et al., 1993</i>
Rewards, incentives and compensation based on creative ideas and innovative projects	<i>Bloom, 2001; Dul, 2014; Kuratko et al., 2014; Surowiecki, 2004</i>

Risk taking, tolerance to failures	<i>Kuratko et al., 2014; Rutherford & Holt, 2007</i>
Training activities based on enforcement of new ideas and prototypes	<i>Schmelter, 2010</i>
Training on creativity and problem solving	<i>Kaya, 2006; Schmelter, 2010</i>

Table 3: Elements of the maturity checklist within Exprivia

Individual-related factors	Highlights
Personal and psychological characteristics	<ul style="list-style-type: none"> • Employee show a feel for discovery and experimentation • Team working and other social skills are present and appreciated • Younger employees are motivated and eager for action
Technical and professional factors	<ul style="list-style-type: none"> • Mixed HR profiles include business and technical competencies • People possess specialized and horizontal skills (e.g. analytical thinking) • Technical and professional certifications are recommended
Organization-related factors	Highlights
Principles and system of values	<ul style="list-style-type: none"> • Challenging and risky initiatives are sponsored when possible • Creative behaviors and tenacity are stimulated to let the innovation potential of employees emerge • Delegation and empowerment is recognized for employees engaged in creativity and innovation-related issues • Job satisfaction is crucial and supported by an internal job posting system to favor the sharing of distributed skills and expertise, inside the corporation and nearby the customers • Knowledge sharing and informal/unstructured learning are highly recommended • Proposition of new ideas is encouraged when aimed to improve product/service portfolio and explore entrepreneurial opportunities • Team working is particularly important, especially in large and multi-stakeholder projects
Management practices	<ul style="list-style-type: none"> • Interdisciplinary teams are assembled to focused on innovative ideas in emerging domains • Periodic meetings with new companies and spin-offs are held to explore possible collaborations • Research programs are sponsored using internal funds • Roadmaps for innovation are collaboratively defined • Small companies are acquired to be re-launched on the market

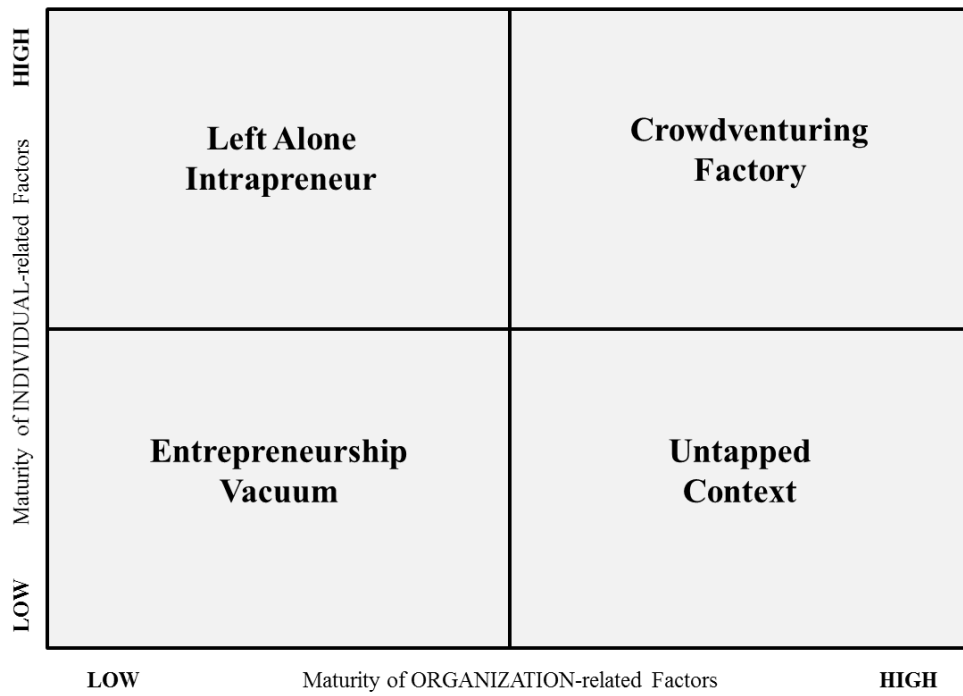


Figure 1 - Crowdventuring matrix with company archetypes

Appendix – Questionnaire (Crowdventuring assessment tool)

1 - Completely False; 2 - False; 3 - Neither False nor True; 4 - True; 5 - Completely True

Section [A] : PSYCHOLOGICAL CHARACTERISTICS of EMPLOYEES					
Items	Evaluation				
	1	2	3	4	5
[A1] Employees are flexible against changes and are comfortable with complexity					
[A2] Employees are independent and able to operate autonomously					
[A3] Employees are creative and capable to propose innovative ideas and solutions					
[A4] Employees are self-motivated, possess self-confidence, and have a desire of achievement					
[A5] Employees are willing to assume responsibilities					
[A6] Employees are able to influence positively colleagues and managers					
[A7] Employees possess social skills and are able to network					
[A8] Employees have a good attitude towards risk-taking					
[A9] Employees possess tenacity and passion for work					
[A10] Employees actively engage in observation of customer behavior and market trends					
[A11] Employees have a feel for discovering and experimentation					

Section [B] : PROFESSIONAL CHARACTERISTICS of EMPLOYEES					
Items	Evaluation				
	1	2	3	4	5
[B1] Employees possess high education levels (Master's and PhD degrees)					
[B2] Employees have previous entrepreneurial experiences					
[B3] Employees use experimentations and scientific methods to achieve specific goals					
[B4] Employees have a specialized core of technical knowledge					
[B5] Employees possess multidisciplinary knowledge (legal, business, technical, etc.)					
[B6] Employees possess analytical thinking, use imagination and intuition during the job					

Section [C] : SYSTEM of VALUES of the ORGANIZATION					
Items	Evaluation				
	1	2	3	4	5
[C1] Your organization stimulates knowledge sharing and learning processes					
[C2] Employees are stimulated to take risks and achieve ambitious goals					
[C3] Trust and loyalty are important values in your organization					
[C4] Your organization valorizes the peculiar skills and competencies of people					
[C5] Collaboration and team working involving people of different functions (e.g. marketing, R&D) are encouraged and fostered					
[C6] Your organization promotes delegation and empowerment of employees					
[C7] Your organization endorses communication and informal links among employees					
[C8] Training activities are focused on developing creativity and problem solving skills					
[C9] Creativity and the ability to take entrepreneurial risks are important elements when management is appraised and recognized					
[C10] The earnings of the management are linked to the level of entrepreneurial results and innovation performances they achieve					
[C11] The successful development of new activities (e.g. capture of a new market, introduction of a new product, improvement of a process) plays a central role for personal career development					
[C12] Creative ideas are highly appreciated in your organization					

[C13] Your organization promotes participative leadership and decision making					
[C14] Your organization pursues job satisfaction and gives commitment to the teams					
[D15] Failure is tolerated in your organization					

Section [D] : MANAGEMENT PRACTICES of the ORGANIZATION					
Items	Evaluation				
	1	2	3	4	5
[D1] Employees with innovative ideas receive management encouragement and feedback					
[D2] Your company provides “spaces” (e.g. brainstorming rooms, laboratories) and tools (e.g. software, technical equipment) for developing new ideas, prototypes and projects					
[D3] Employees with a good idea are given free time to develop it					
[D4] Job rotation is generally applied at operational and managerial level					
[D5] Your organization is active in inventing and protecting (e.g. patents) new artifacts, processes, technologies and solutions					
[D6] In your organization, there are dedicated funds to launch entrepreneurial initiatives					
[D7] In your organization, there is a dedicated unit to support employees and managers aiming to realize an entrepreneurial initiative					
[D8] In your organization, there is a formalized procedure to follow for employees and managers willing to realize an entrepreneurial initiative					
[D9] Your organization cooperates with external partners (e.g. customers, suppliers, distributors, research centers) to develop new products, services and ventures					
[D10] Your organization encourages employees to suggest improvements to processes, products and practices					
[D11] Your organization organizes initiatives (e.g. courses, seminars, workshops) to develop entrepreneurial behaviors and competencies in the employees					
[D12] Training is focused on the enforcement of ideas/innovations by developing key competencies (e.g. project management, resource sourcing, networking)					
[D13] Recruitment is addressed to hire people with entrepreneurial characteristics (e.g. creativity, autonomy, proactivity, risk orientation)					
[D14] A career promotion usually follows from the development of innovative ideas					
[D15] Individuals with successful innovative projects receive additional rewards and compensation beyond the standard reward system					
[D16] People are encouraged to talk to employees working in other departments about innovative ideas for new projects					
[D17] Employees have autonomy on their job and can use own methods to do the work					
[D18] Managers help employees to get the work done by removing obstacles and barriers					