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Transformative business strategies and new patterns for value creation

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**Transformative business strategies
and new patterns for value creation**

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***Referred Electronic
Conference Proceeding***

Full Papers

a cura di

*Claudio Baccarani, Marco Frey, Gaetano M. Golinelli,
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Al Lettore,

questo volume accoglie i *full paper* del Convegno Sinergie-Sima 2018 *Transformative business strategies and new patterns for value creation*, Università Ca' Foscari, Venezia, 14-15 giugno 2018.

Di norma, la trasformazione di un settore prende il via dall'adozione di una nuova tecnologia. Tuttavia, ciò che rende possibili cambiamenti importanti di un settore è un modello di business che connetta la nuova tecnologia con un bisogno di mercato, in modo da creare una nuova combinazione nel processo di creazione del valore.

Lo scopo del Convegno è discutere dei modelli di business “trasformativi” e delle necessarie evoluzioni strategiche come sfide per la gestione dell'impresa nel prossimo futuro, creando relazioni tra studiosi, diffondendo la conoscenza in campo economico-manageriale e promuovendo il contributo degli studiosi italiani al dibattito internazionale sui temi del management.

Claudio Baccarani, Marco Frey, Gaetano M. Golinelli, Alberto Pastore, Tiziano Vescovi

Cari Lettori e Convegnisti,

il call for paper del Convegno Sinergie-Sima 2018 ha previsto la possibilità di presentare *extended abstract* oppure *full paper*. In totale sono pervenuti in redazione 115 *extended abstract* e 45 *full paper*.

Per gli *extended abstract*, la valutazione dei contributi ricevuti è stata operata dal Comitato Scientifico in base alla coerenza con il tema del Convegno e/o con gli studi management secondo i Gruppi Tematici SIMA, alla chiarezza e alla rilevanza (anche potenziale) dei contenuti proposti.

Per i *full paper*, la procedura di valutazione dei contributi è stata condotta secondo il meccanismo della *peer review* da parte di due referee anonimi, docenti universitari ed esperti dell'argomento, scelti all'interno dell'Albo dei Referee della rivista *Sinergie*.

In particolare, i referee hanno seguito i seguenti criteri nella valutazione dei contributi:

- chiarezza degli obiettivi di ricerca,
- correttezza dell'impostazione metodologica,
- coerenza dei contenuti proposti con il tema/track del convegno e/o con gli studi management,
- contributo di originalità/innovatività,
- rilevanza in relazione al tema/track del convegno e/o agli studi management,
- chiarezza espositiva,
- significatività della base bibliografica.

L'esito del referaggio ha portato a situazioni di accettazione integrale, accettazione con suggerimenti e non accettazione. In caso di giudizio discordante la decisione è stata affidata alla Direzione Scientifica. Ogni lavoro è stato poi rinviato agli Autori completo delle schede di referaggio per la valutazione delle modifiche suggerite dai referee, verificate in seguito dalla Redazione della rivista *Sinergie*.

A seguito del processo di valutazione sono stati accettati 29 *full paper* e 115 *extended abstract*, pubblicati in due distinti volumi. In questo volume dedicato ai *full paper*, i contributi sono articolati nelle seguenti *track*:

TRACK DEL CONVEGNO

- Strategy between theory and practice
- Strategia tra teoria e pratica
- Rethinking strategy: strategic engagement for value creation
- Business models evolution: technology and beyond
- L'evoluzione dei modelli di business tra big data e tecnologia
- **Marketing strategies to create customer value**
- Business strategies for a better world
- Competition and collaboration in business
- La prospettiva del consumatore al valore
- Decision support systems, networks and strategy
- Crowdfunding as a new business model

TRACK SIMA

- Innovation and technology management
- Tourism and culture management
- Sustainability
- Small and family business
- Marketing & Communication

Tutti i *full paper* di questo volume sono stati presentati e discussi durante il Convegno e pubblicati *online* sul portale della rivista *Sinergie* (www.sinergiejournal.it).

Nel ringraziare tutti gli Autori per la collaborazione ci auguriamo che questo volume contribuisca a fornire un avanzamento di conoscenze sui modelli di business "trasformativi" e sulle necessarie evoluzioni strategiche come sfide per la gestione dell'impresa nel prossimo futuro.

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Collaborative innovation types and performance of firms: insights on consumer innovation

BEATRICE ORLANDO* ALESSANDRO DE NISCO• GIUSEPPE SANCETTA^

Abstract

Objectives. *Current study aims to understand the dynamics of collaborative innovation between firm and clients. Our research questions are: what is the most valuable collaboration type? How does it impact innovative performance of firms?*

Methodology. *As for the methodology and consistently with explorative aim of the study, we use one-way Anova to test validity of our hypotheses. Then, we measure correlations among variables.*

Findings. *Findings largely confirm model hypotheses. We identify five different patterns of collaboration. At large, firms for which collaboration is the most valuable method have better innovative performance than others and they also tend to search for collaborations broadly. Firms adopt collaboration with clients to co-design the meaning of incremental innovation.*

Research limits. *The explorative intent led us too choose a general statistic method, although more robust and sophisticated tests are necessary to achieve a clearer knowledge on the phenomenon.*

Practical implications. *The study suggests that firms should be more externally oriented to achieve radical innovation. Precisely, collaboration with both clients and suppliers is the most valuable method.*

Originality of the study. *As far as we can see, none of prior studies distinguishes the impact of specific collaborations on either the different dimensions of innovative performance of firms or value co-creation.*

Key words: *user innovation; open and collaborative innovation; innovative performance; customer innovation; value co-creation; design-driven innovation.*

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1. Introduction

Tautological as it may seem, even the conception of innovation reflects the zeitgeist of times. Though, and that is the curious fact, not so many authors pay sufficient attention to explaining how does the essence of innovation paradigm in use reflects the societal weltanschauung and what are the very core implications for developing and marketing innovations.

The term weltanschauung was firstly and metaphorically used by the philosopher Immanuel Kant (1790) to signify an individual imagine of the world in a specific stage of his/her knowledge. Lately, Weber *et al.* (1904, 1905) used the term to identify a sort of intuition that people have of the world, or, more precisely, their idealistic representation of it. Also, the term was frequently used by the psychologist Jung throughout his work: he anchors the individual weltanschauung to an external objectified knowledge. In this work, we originally consider the concept of societal weltanschauung as the collective representation of the world in a given time range. It is the result of the prominent culture of a vast community and it manifests itself as a sort of objectified truth. It spurs from and is the synthesis of a mix of factors, from economy to technology. More in detail, it can be portrayed as a collective knowledge, which serves as the reference point for the individual. Such knowledge is embedded in artifacts, embodied in individuals and drives their emotions. The goals of firms is to intercept and anticipate time by time the societal weltanschauung, thus structuring their offer accordingly. That is precisely the ultimate aim of innovation, indeed. As a further detail, this knowledge has a bridging function between the individual and the society. One individual trusts the societal weltanschauung almost uncritically and this condition determines his/her expectations and needs. As for that, prospect innovations are expected to be in line with this collective orientation. They must reflect the times, not only in technological terms. According to this conjecture, the economic paradigm in charge both reflects and influences in its turn the current societal weltanschauung. Current work finds its very rationale in the concept of societal weltanschauung.

To make a clear example of how the societal weltanschauung and the economic paradigm are mutually connected, theoretical formulation by Schumpeter (1942) assumes that innovation is undertaken almost exclusively by producers. Many years later, von Hippel (1998) brilliantly found out that users - rather than suppliers - are the actual designers of the goods. Lately, Chesbrough (2003a and 2003b) noticed that a change in paradigm had occurred at firm level, which implications relate to openness of the firm toward external and modes of developing innovation.

What has changed in sixty years between Schumpeter and Chesbrough is the logic of inclusion: with Information and Communication Technology (ICT) people actively participate of business, politics, society, economics, and, most of all, to the formation of a collective knowledge (e.g. let us think about the case of Wikipedia). This trend has now been taken to the extreme, as we can witness in everyday social media. Paradoxically, the culture of inclusiveness, social media presence and instant sharing is culminated in an extreme individualism, or, better to say, in the struggle between individualism and collectivism: “Does the individual’s life belong to him-or does it belong to the group, the community, society, or the state?” (Biddle, 2012, p. 1). In a society of stranded certainties, modern economists so far centered their theories on the concept of self-realization through models such as the popular one of utility maximization. Yet, they do not consider how this maximization is affected by herd belief. One of the great thinker of the last century, Nietzsche (1882) foretold that the modern era could have brought a preference for herd mentality, which one can escape only through searching for authenticity. Recent empirical studies (Varnum *et al.*, 2010, Grossmann and Varnum, 2015, Santos *et al.*, 2017) investigating the markers of individualism - mostly consumptions and other behavior in search for uniqueness - found evidence that individualism has been rising steadily for more than a century. Though, only one out of six tested cultural psychological theories predicts such shift toward uniqueness in individual preferences (Varnum and Grossman, 2017). The implication of aforementioned conjectures is huge for strategy scholars. The diktat of today societal weltanschauung can be expressed as the search for uniqueness as a means for authenticity, which is caused by the struggle between individualism and collectivism. At a practical level, this societal momentum can be translated in the search for innovation that are

customers designed, where the customer is allowed to determine the quantum of uniqueness he/she desire for him/herself in novel products. At a business level, this drastically affects the value-proposition of the company and, obviously, its performance: the product life-cycle is shrunk continuously, as much as the time-to-market.

Combining such conditions with the customers' need for uniqueness, it turns out that the new economic paradigm is centered on collaborative innovation indeed, but its roots also go way far more in-depth: the need for co-designing the novelty meaning attains the self-realization in terms of uniqueness. Despite a myriad of contributions have proliferated in the field of open innovation, value-co-creation and other related topics, none of them focuses on how collaborative innovation with customers in the design phase reflects and impacts the economic paradigm as the result of current societal *weltanschauung*. The design phase, by definition, involves to draw *ex ante* the new meaning of the good. In current study, the new meaning is influenced by societal *weltanschauung*, as we have labeled and described it.

Thus, our study go in-depth of open and collaborative innovation implications for innovative performance of firms by explaining how current paradigm is informed by today societal *weltanschauung*. Taking the cue from von Hippel (1998), we explain the economic and sociologic rationale for collaborative innovation with clients. Almost unprecedented, we also disentangle the impact of having different partners in open innovation on innovative performance.

Open innovation has surged to attention as a powerful means for overcoming firm's limitations when it has to develop a novelty. Roughly, it consists in employing external assistance to produce new knowledge and ideas and in supporting their marketing. What have added a huge lead to open innovation, is the rise and mass-diffusion of digital technologies, which are facilitators for collaboration and a vehicle for funneling the intake of knowledge. External subjects could have a wide array of motivations for siding with the firm in innovation development. But, what is the inherent motivation for clients? We argue the ultimate reason lies far beyond just having a customized good or filling a prior unmet need. Clients search for differentiated and identity-reflecting meanings in new goods. By consequence, one main kind of innovators in this sense are users, customers and collaborative communities, which are usually motivated by intrinsic considerations and are informally organized (Boudreau and Lakhani, 2013).

Despite the extreme relevance of the topic, apparently previous literature have scantily investigated the impact of change in societal mindset onto collaborative innovation strategy. Moreover, there is a poor understanding of the dynamics of collaboration choices. Current paper is aimed to tackle these gaps. We propose a customer-centric model for collaborative innovation, which ultimately affects the way the openness is set. The model is tested on a large-scale sample of innovative European firms.

For the remainder, the paper is structured as follows: section 2 synthesizes main literature antecedent, section 3 presents the model, section 4 describes the empirical analysis. Finally, section 5 is left for authors' concluding remarks.

2. Collaborative and open innovation studies

2.1 Genesis and characteristics of open innovation

Collaborative innovation refers to the co-development of an innovation leveraging on a commitment which is shared and distributed among different actors (Blomqvist and Levy, 2006; Ketchen, Ireland and Snow, 2007; Baldwin and Von Hippel, 2011; Davis and Eisenhardt, 2011). This collaborative mode is also renewed as open innovation (Chesbrough, 2006; Enkel, Gassmann and Chesbrough, 2009; Van de Vrande *et al.*, 2009; Dahlander and Gann, 2010; Gassmann *et al.*, 2010; Huizingh, 2011).

Following Chesbrough and Crowther (2006), companies leverage on external discoveries - inbound open innovation -, and external firms to commercialize their innovation - outbound open

innovation, or both of them - coupled open innovation. This way firms realize a Kuhnian anomaly “of having the benefits of the innovation accrue not to the firm that financed its development, but instead to other firms who were able to capture the benefits of the innovation”. (Chesbrough and Crowther, 2006; p. 230). In a nutshell, open innovation allows to improve firm ambidexterity, which is a combination of either technology exploitation or exploration (Gibson and Birkinshaw, 2004; Van de Vrande *et al.*, 2009). Extant literature on open innovation is extremely copious. Most scholars praise open innovation (Bogers, 2011), others see it as “old wine in a new bottle” (Trott and Hartmann, 2009).

The concept of open innovation was firstly introduced by Chesbrough (2003b) and it refers to “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively” (Chesbrough, 2006; p.1). For Lichtenthaler, “Open innovation is defined as systematically performing knowledge exploration, retention, and exploitation inside and outside an organization’s boundaries throughout the innovation process”. (Lichtenthaler, 2011; p. 11). It is also “the attitude of a firm of balancing in flow of knowledge and outflow of knowledge through the prevalence of inbound and outbound practices” (Mazzola *et al.*, 2015; p.109). There are those who glimpsed in the same words (open innovation) an establishment of ties of innovating firms with other organizations (Lichtenthaler 2008). Other authors focus on open innovation as the external inflow of knowledge (Vanhaverbeke and Van de Vrande, 2008; Lichtenthaler, 2011; Xia and Roper, 2016). Dahlander and Gann (2010) study the construct of openness in terms of knowledge flows. Similarly, Laursen and Salter (2006) consider individual firm’s openness in terms of external search, so that the breadth and depth of the search determine openness. Consistently, other studies propose proxy measures for open innovation in relation to exploitation and exploration activities (Dogson *et al.*, 2006; van de Vrande *et al.*, 2009). Henkel (2006) interprets openness in light of the revealing behavior of the firm.

Previous reviews (Elmquist *et al.*, 2009) identify seven streams in open innovation researches: notion of open innovation, business model, organizational design and boundaries of the firm, leadership and culture, tools and technologies, intellectual property, industrial dynamics and manufacturing. Later review articles extend and update this categorization (Giannopoulou, *et al.*, 2010; Lichtenthaler, 2001; Schroll and Mild, 2012; Wikhamn and Wikhamn, 2013; West and Boger, 2014; Greco *et al.*, 2015; Schueffel and Vadana, 2015).

Most authors agree on the positive role of open innovation in technology scouting (Laursen and Salter, 2006). In fact, vertical technology collaboration are deemed as a tool to capture collaborative relationships with customers or suppliers (Baum, Calabrese and Silverman, 2000; Enkel *et al.*, 2005). Also, they are a driver for customer loyalty (Ozkan, 2015). Another stream of researches pay attention to motivations for adopting open innovation (Perkman and Walsh, 2007; Dittrich and Duysters, 2007; Chesbrough and Appleyard, 2007).

2.2 *Types of collaborations in open innovation: collaborative innovation with clients- a hot topic under research radar?*

Having clear what are the types of collaborative innovation and how they impact performance of firm is a relevant topic both for academia and for practitioners. Open innovation practices strongly impact innovation performance (Ebersberger *et al.*, 2012; Bengtsson *et al.*, 2015 Lassen and Laugen 2017). Though, what is the differential impact of each of them?

Previous findings shows that firms provided with information from market sources and from internal sources as well as firms involved in science-based collaboration for their product innovations are more likely to introduce new to the market innovations (Mention, 2011). Perkman and Walsh (2007) address the impact of university-industry relationship, by arguing that this is the most valuable method in open innovation. Similarly, other scholars propose that R&D collaborations with universities are likely to have the highest impact on product innovation, followed by R&D collaborations with suppliers, customers, and, finally, competitors (Un *et al.*, 2010). One of the main problem in extant studies on collaborative innovation with clients is that

they do not properly acknowledge its positive effect. By contrast, scholars argue that collaboration with customers do not appear to affect product innovation (Un *et al.*, 2010; Un and Asakawa, 2015). However, there is a main issue with such finding: it does not match with actual practices.

3. A framework for a customer designed meaning in collaborative innovation

This study proposes a new conceptual framework for collaborative innovation with customers. The main rationale underlying current work is the witnessing of a revolution in individual behaviors, which reflects the new societal *weltanschauung*, combined with the massive diffusion of digital technologies, such as platform, which allow to facilitate collaboration mechanisms. The individual is at the center of the universe, he/she beseeches and longs for out-of-the-box novelties, he/she worships individualism at its purest core. The firm cannot disregard this new wind when designing its innovations-to-be. Amidst other collaborations form, the one with customers seem to best reflect the sense of this cultural revolution. It occurs at the meaning-definition level. The span of firm creativity benefits from this button up approach. Yet, it remains a trade-off between creativity and innovation economics. A firm must also be prepared in strategy and business model to face such revolutionary challenges. Does this customer-centric approach is fitting for any innovation type? How does differences in collaboration types impact innovative performance of firms? What is the most valuable collaboration type? How actually is open a collaboration-with-clients strategy? That broad is the span of answers we aim to provide with our analysis. We argue that in a deconstructed and individualistic societal panorama, consumer choices are self-centered and mostly blind to undifferentiated meanings. In such a world, individual struggles to relate to global and uniform meanings, so that we are increasingly witnessing to a run-away of firms from offerings indistinct solutions. We hypothesize the firm might prefer a customer-designed-meaning approach to innovation. The reason lies behind the fact that collaboration with clients involves a greater creativity intake from outbound. As a result, firms favor client design-collaboration in open innovation over other forms. At a managerial level, implications are related to the evidence of the rising need for flexible business models and open strategies. Thus, we advance theory by proposing a collaboration-differentiated insight on openness of firms. To the core, innovation occurs as a bundle of meanings which are definition-shared with the client.

Thus, the main model assumption is that collaboration with clients entails a medium/high degree of firm's openness. Consistently with above premises, we formulate the following hypotheses:

- Hp.1: collaboration with clients/customers is positively related to innovative performance;
- Hp.2: collaboration with clients/customers is positively related to incremental innovation, negatively to radical innovation;
- Hp.3: collaboration with clients/customers is positively related to marketing innovation
- Hp.4: collaboration with clients/customers is positively related to meaning-design of goods.

To the end of explaining how current model innovates extant theory, the following table reports some of the main empirical findings of prior studies.

Tab. 1: Main findings of prior studies on effectiveness of collaborative innovation with customers

Possible associations with current model hypotheses	Main studies	Findings
Hp.1	Laursen and Salter 2006 Von Hippel 1988	"firms' innovation activities are strongly determined by relations between themselves and their suppliers and customers."
Hp.2	Tsai 2009 Tödtling, Lehner and Kaufmann 2009	Partnership with customers have no influence on radicalness of the innovation
Hp.3	Sawhney, Verona and Prandelli 2005	Collaborative innovation with customers via digital platforms facilitate product innovation and customer engagement
Hp.4	Sawhney, Prandelli and Verona 2003	Virtual customers community can support mass customization and other marketing initiatives by becoming co-designers of products and services

Source: our elaboration

Although late scholars were concerned with similar research wonderings, their findings are far from being conclusive. Moreover, none of them have empirically tested the relationship between collaborative innovation with customers in the design phase and innovative performance.

Accordingly, the hypothesis 4 stands out as the original one. To synthesize, the main elements of our model are the followings:

1. type and existence of the collaborative innovation partnership (with private or public customers, with suppliers, with competitors, with firms within the enterprise group);
2. perception of managers with regard to how much is valuable each collaboration form;
3. innovative performance of the firm (radicalness, type of innovation -product, service, process, marketing, organizational -, firm's engagement to innovativeness - continuous or discontinuous R&D activities, external innovation adoption, early stage of the innovation diffusion, open versus closed innovation).
4. collaboration in the sphere of meaning design.

Yet, we also assume that co-designing the meaning of innovation with clients (as instance the aesthetics or the packaging) entails customization. Customization is a tool for meeting the need for uniqueness of clients. In sum, a novel artifact is a means for accomplishing the individual self-realization. This way, collaborative innovation with clients becomes more than merely a business fact. This form of collaboration is logically and inherently linked with the current societal *weltanschauung*, since it reflects the rising of individualism in society. Such individualism is allowed by current status of technology and by firms' increasing favor toward open innovation.

In a broader sense, the intensification of collaboration with clients in the depth dimension of openness can be deemed as a milestone in the transition toward the next economic paradigm. Today collaboration with clients occurs with means, modes, and intents that are drastically different from those in the past decades. Any client gives for granted that he/she will be deeply involved in the design phase of the innovation process. He/she might not always have the technical competences required for the action, nonetheless he/she expects to rule over the process output. Any different firm's behavior is out-of-date and it will turn out in a total draw-back. One important consequence is that all the other collaboration forms are subordinated, they only serve to realize the customer's designed output. Consistently, this collaboration form has the hugest impact on firm's innovative performance over others. In this sense, it is possible to deem the hypothesis 4 as a clue of the change in the economic paradigm.

The portrayed framework is tested on a large-scale sample of European firms. On the practical side, this model is a trailblazer for the definition of a more customer-sounding business model and for innovation-design approach.

4. The empirical investigation

4.1 Sample

The sample was collected in, 2014 and updated over-time constantly. Last update refers to January, 2017. Data were retrieved online, from Eurostat, and extracted from Community Innovation Survey (CIS). This survey is based on responses of individual industries. For all firms in the sample, innovation is the core activity: they are product and/or process innovative enterprises, regardless of organizational or marketing innovation (including enterprises with abandoned/suspended or on-going innovation activities). In total, the sample includes 403.855 European firms aggregated per Country-level. Firms are categorized by NACE rev.2 code and by size class. The dataset contains observations from a harmonized survey questionnaire, which was mailed or online distributed. Answer are mostly of two types: yes-or-no questions, degree of importance questions (high, medium, low, not relevant).

4.2 Method and variables

Consistently with the explorative intent of the study, we verify in the first stance that there are statistically significant differences between groups, as a means to reject the null hypothesis.

For this motive, first, we perform one-way Anova test; second, we measure the correlation among variables. Our measurement variable is the number of respondents aggregated per Country. Nominal variables are: collaboration with different types of partners, goods innovation and service innovation, market and governance, innovation activities types, organizational and marketing innovation, product and process innovation. Partners in collaborations are: other enterprises within the enterprise group, competitors or other enterprises of the same sector, clients or customers from the private sector, clients or customers from the public sector, suppliers of equipment, materials, components or software. Our dependent variable is collaboration and it can be measured at the interval level. To give a further clue on our operationalization of variables with regard to hypothesis 4, we analyze the relationship between the variable “enterprises that introduced significant changes to the aesthetic design or packaging” and collaboration with clients, both from the public and the private sector. More in detail, the analysis were conducted alternatively considering either the number of firms implementing this collaborations type or the number of those which deem such collaboration as extremely valuable. This kind of operationalization is fitting with the need of corroboration of the hypothesis 4. At large, a similar process was adopted to corroborate all other hypotheses. For more details on corroboration of constructs see all later tables.

Yet, we consider all other nominal variables as proxies for innovative performance, which is our independent variable and consists of 31 categories. For more details on such categories see the labels reported in tables of section 4.3. Observations are independent, there are no significant outliers, there is homogeneity of variances and dependent variable is approximately normally distributed for each category of the independent variable (Box and Cox, 1964; Ramsey, 1969; Lunney, 1970; Mood, 2010; Snijders, 2011).

We group firms in the sample into two different clusters: firms having external collaboration; firms for which collaboration is the most valuable method. Cluster-grouping increases significance of results. Firms included in the first cluster are those which deem collaboration as the most valuable method. Differently, the second cluster includes firms which generally implement some form of collaborative innovation.

For each and every set we perform one-way Anova test and we measure correlations. This distinction allows to obtain more significant and more precise results. The analysis is cross-sectional, coherently with the aim of exploring the existence and magnitude of relationships between our dependent variable (collaboration with clients) and the set of aforementioned independent variables. To keep tables lean and convey findings, we include only essential correlations for the relationship between collaboration and innovative performance. Streamlined tables mostly display correlations which value is greater than 0,8.

4.3 Findings

Results of the Anova test for the first cluster allow to reject the null hypothesis (first type error) and accept the alternative hypothesis (second type error). The means appears significantly heterogeneous (one-way Anova, $F_{35,1080} = 3,891433347$, $P = 6,94756E-13$). Precisely, we have $F_{35,1080} = > F_{sig} = 1,433958471$, with a probability of being obtained, starting from homogeneous groups, $P = 6,94756E-13$ (with $\alpha = 0,05$). Results of one-way Anova for the first set are reported in table 2.

Tab. 2: One-way Anova- cluster n. 1 ($\alpha = 0,05$)

Origin of variation	Sum of squares	Degrees of freedom	Mean square	F	P	F sig.
Among groups	1799620247	35	51417721,34	3,891433	6,94756E-13	1,433958
Within groups	14270098981	1080	13213054,61			
Total	16069719228	1115				

Source: our elaboration

Similarly, results of the Anova test for the second set allow to reject the null hypothesis (first type error) and accept the alternative hypothesis (second type error). The means appears significantly heterogeneous (one-way Anova, $F_{35, 1080} = 3,19448106$, $P = 2,25907E-09$). Precisely, we have $F_{35, 1080} = 3,19448106 > F_{sig} = 1,433958471$, with a probability of being obtained, starting from homogeneous groups, $P = 2,25907E-09$ (with $\alpha = 0,05$). Results of one-way Anova for the second set are reported in table 3.

Tab. 3: One-way Anova- cluster n. 2 ($\alpha = 0,05$)

Origin of variation	Sum of squares	Degrees of freedom	Mean square	F	P	F sig.
Among groups	1542546118	35	44072746,22	3,19448106	2,25907E-09	1,433958
Within groups	14900249846	1080	13796527,63			
Total	16442795963	1115				

Source: our elaboration

The size of the sample is large enough, so that observations within each group are approximately normally-distributed (Box and Cox, 1964; Ramsey, 1969; Lunney, 1970; Mood, 2010; Snijders, 2011). As for this reasons, we can conclude the possibility the null hypothesis (H_0) is true can be rejected in both cases.

Afterwards, we have measured correlations among variables for each of the two sets. The aim is to understand how much each pair of variables are close to have a linear relationship with each other. Results of correlation statistics are reported in table 4 and 5.

Tab. 4: Main correlations among variables - cluster n. 1

	Enterprises for which cooperation with other enterprises within the enterprise group is the most valuable method	Enterprises for which cooperation with competitors or other enterprises of the same sector is the most valuable method	Enterprises for which cooperation with clients or customers from the private sector is the most valuable method	Enterprises for which cooperation with clients or customers from the public sector is the most valuable method	Enterprises for which cooperation with suppliers of equipment, materials, components or software is the most valuable method
Enterprises for which cooperation with clients or customers from the public sector is the most valuable method	0,783276879	0,5475	0,8586	1	
Enterprises for which cooperation with suppliers of equipment, materials, components or software is the most valuable method	0,866939517	0,913489	0,845648	0,70155	1
Enterprises that developed goods innovation	0,671875493	0,737864	0,846772	0,833235	0,799031

Enterprises that developed service innovation	0,716109505	0,733327	0,878868	0,867784	0,814914
Enterprises, engaged continuously in in-house R&D activities	0,755538169	0,693347	0,90786	0,886251	0,80689
Enterprises, engaged occasionally in in-house R&D activities	0,791879715	0,746619	0,895409	0,848208	0,861313
Enterprises, engaged in acquisition of machinery, equipment and software	0,584106974	0,809982	0,369067	0,200137	0,759466
Enterprises, engaged in market introduction of innovations	0,701159578	0,80944	0,426193	0,276634	0,795735
Enterprises, engaged in external R&D activities	0,818006094	0,669879	0,917633	0,865442	0,81914
Enterprises, engaged in in-house R&D activities	0,774733547	0,715002	0,912046	0,884447	0,829678
Enterprises that introduced significant changes to the aesthetic design or packaging	0,632094877	0,696384	0,827772	0,847593	0,748017
Enterprises that introduced new methods for product placement	0,572994464	0,551242	0,851309	0,881549	0,650466
Enterprises that introduced new media or techniques for product promotion	0,680853379	0,739947	0,856428	0,843609	0,80092
Enterprises that introduced new methods of pricing goods or services	0,662111357	0,700959	0,835013	0,843544	0,763584
Enterprises that introduced new business practices for organising procedures	0,730814021	0,712149	0,877242	0,893428	0,795843
Enterprises that introduced new methods of organising external relations	0,69863913	0,664856	0,870913	0,897206	0,75693
Enterprises that introduced new methods of organising work responsibilities and decision making	0,740033724	0,746645	0,863461	0,876743	0,81774
Enterprises that have introduced new or significantly improved products that were only new to the firm	0,57330532	0,581262	0,78594	0,818999	0,651464
Enterprises that have introduced new or significantly improved products that were new to the market	0,713609401	0,795639	0,762424	0,719412	0,827687

Source: our elaboration

Tab. 5: Main correlations among variables - cluster n. 2

	Enterprises co-operating with other enterprises within the enterprise group	Enterprises co-operating with competitors or other enterprises of the same sector	Enterprises co-operating with clients or customers from the private sector	Enterprises co-operating with clients or customers from the public sector	Enterprises co-operating with suppliers of equipment, materials, components or software
Enterprises co-operating with competitors or other enterprises of the same sector	0,957839	1			
Enterprises co-operating with clients or customers from the private sector	0,963787	0,977224	1		
Enterprises co-operating with clients or customers from the public sector	0,941148	0,95698	0,98584	1	
Enterprises co-operating with suppliers of equipment, materials, components or software	0,980901	0,982152	0,969005	0,937538	1

Source: our elaboration

In a nutshell, findings for the first cluster are the followings:

- a) firms for which collaboration with clients/customers from the private sector is the most valuable method also consider likewise valuable collaborations with clients/customers from the public sector.
- b) firms for which cooperation with suppliers of equipment, materials, components or software is the most valuable method also consider likewise valuable collaborations with other enterprises within the enterprise group, with competitors or other enterprises of the same sector, with clients/customers from the private sector,
- c) for firms that developed goods innovation, collaborations with both private and public clients/customers are the most valuable methods;
- d) for firms that developed service innovations, collaborations either with clients/customer or suppliers are the most valuable methods;
- e) for firms engaged either continuously or occasionally in in-house R&D, collaborations with clients/customer and suppliers are the most valuable methods;
- f) for firms engaged in acquisition of machinery, equipment and software, collaborations with competitors or other enterprises of the same sector are the most valuable methods;
- g) for firms engaged in market introduction of innovations, collaboration with competitors or other enterprises of the same sector are the most valuable methods;
- h) for firms engaged in external R&D activities, collaborations with other enterprises within the enterprise group, with clients/customers from the private/public sector, and with suppliers are the most valuable methods;
- i) for firms engaged in internal R&D activities, collaborations with clients/customers from the private/public sector and with suppliers are the most valuable methods;
- j) for firms that introduced significant changes to the aesthetic design or packaging, that introduced new methods for product placement or that introduced new methods of pricing goods or services, collaborations with clients/customers from the private/public sector is the most valuable method;
- k) for firms that introduced new media or techniques for product promotion, collaborations with clients/customers from the private/public sector and with suppliers are the most valuable methods;

- l) for firms that introduced new business practices for organizing procedures or that introduced new methods of organizing external relations, collaborations with clients/customers from the private/public sector is the most valuable method;
 - m) for firms that introduced new methods of organizing work responsibilities and decision making, collaborations with clients/customers from the private/public sector and with suppliers are the most valuable methods;
 - n) for firms that that have introduced new or significantly improved products that were only new to the firm, collaborations with clients/customers from the public sector is the most valuable method.
 - o) for firms that have introduced new or significantly improved products that were new to the market, collaborations with suppliers is the most valuable method.
- Differently, for the second group the most significant findings are the followings:
- a) firms collaborating with competitors or other enterprises of the same sector tend to collaborate also with other enterprises within the enterprise group;
 - b) firms collaborating with clients/customers from the private sector tend to collaborate also with other enterprises within the enterprise group and with competitors or other enterprises of the same sector;
 - c) firms collaborating with clients/customers from the public sector tend to collaborate also with other enterprises within the enterprise group, with competitors or other enterprises of the same sector and with clients/customers from the private sector;
 - d) firms collaborating with suppliers tend also to collaborate with all the other types of partners.

4.4 Discussion

A large body of empirical analyses suggests that each collaboration form might serve a different purpose (Belderbos *et al.*, 2004). In their literature review paper, Greer and Lei (2012) argue there is a need for a greater understanding of the impact of collaborative innovation with clients on firm performance, because empirical results in this research domain are not homogeneous: much studies assumes net positive benefits from collaboration with customers, other reach opposing results. At large and so far, collaborative innovation with customers was mostly deemed as a partnership useful to reduce the risk associated with the market introduction of a novelty (von Hippel 1988), with a scarce or no impact at all on productivity growth and patenting (Belderbos *et al.*, 2004, Tödtling *et al.*, 2009): “there is no evidence in our analysis that these efforts are effective in improving firms’ performance in bringing novel products to the market.” (Belderbos *et al.*, 2004, p. 11). Apparently, the research domain is exclusively concerned with the impact of the collaborative innovation with customers on innovative performance of the firm.

Another stream of literature examines value co-creation and co-innovation in user-driven networks (Romero and Molina, 2011): “collaborative networks represent a promising paradigm together with customer communities to emphasis on core competencies, personalisation and innovation, supported by collaborative mechanisms. “ (Romero and Molina, 2011, p. 1). The combination of collaborative networks and customer communities are aimed to co-produce a unique value proposition for each consumer (Romero and Molina, 2009) via the discussion contents in virtual communities (Romero and Molina, 2011). This second stream studies the customers’ voluntarily sharing of ideas for the co-development of future innovations (Foray 2004, Esposito De Falco *et al.* 2017). This way customers become proper innovators, because they have been given tools to design and test their own novelty (Nambisan, 2002). This approach seems to be wiser, than instead trying hard to figure out what it will be the “on-the-next” customer’s desire (Thomke and von Hippel, 2002). Generally speaking, the co-creation and co-innovation research domain leverages on the wisdom of crowds in open innovation communities (Romero and Molina, 2011), but it mostly limits its interest to both address what is “in” for each stakeholder and to dynamics of the process.

Also, Verganti (2008) defines the design-driven innovation as “the radical innovation of a product’s meaning” (Verganti 2008, p. 4). Though, the author seems to be convinced that, rather than being user-centered (Verganti and Dell’era, 2009), the design of the meaning of an innovation “is therefore pushed by a firm’s vision about possible breakthrough meanings and product languages that could emerge in the future” (Verganti, 2008, p. 5). Curiously, in the same paragraph the author also argues that “The socio-cultural context in which they (customers) are currently immersed make them inclined to interpretations that are in line with what is happening today. Radical changes in meanings instead ask for radical changes in socio-cultural models, and this is something that might be understood (and affected) only by looking at long-term phenomena with a broader perspective.” (Verganti, 2008, p. 5), somewhat contradicting himself. By contrast, taking the cue exactly from this statement we propose an opposing interpretation. The reason is quite simple: we are witnessing a massive change in the current socio-cultural model, which we have labeled as societal *weltanschauung*. We point out that there are at least three main gaps in the broader field of study, whose extent is by far more reaching than usual: a) how we got here (to collaborative innovation with customers) in terms of profound motivations that go beyond the merely business convenience, b) what are the economic and paradigmatic implications for prospect societal trends, c) at which level this collaboration occurs and what are its effects. Current analysis attempts to tackle the underscored gaps.

Either the change was driven by the rising of digital technologies or by the mass diffusion of open innovation practices at business level, its effects are nonetheless emblematic at a paradigmatic level. Leveraging on concept of the ideal-types of Weberian reminiscence, today social *weltanschauung* is based on solving the struggle between the categories of individualism and collectivism: the former leads to a quest for a continuously evolving uniqueness, the latter solicits a need for social and group identity stronger than ever. Both result in the search for a continuous gale of innovation. In this pursuit, innovation becomes a transitional object (Verganti, 2008), and participation occurs as the massive and instant involvement of users in each and every social aspects, from politics to economics and innovation, mostly via digital platforms. In this sense, we argue collaborative innovation with customers is the clue of a paradigmatic change which is currently on-going.

First, we study the relationship between collaborative innovation with customers and innovative performance.

The interaction mechanism between collaborative innovation and innovative performance of firms is rather the complex phenomenon. Literature is unspecific, to say the list, on whether there is a differential contribution of collaboration forms to innovativeness or not. To overcome this limitation, we distinguish the actual existence of collaborative innovation between customers and firms from perceptions on how much this collaboration can be deemed as valuable. By grouping firms into two different clusters with obtain rather the fine-tuned results. In fact, findings provides a clear confirmation of our model hypotheses: collaborative innovation with customers has a positive impact on innovative performance indeed.

At large, correlation results are higher for the first than the second cluster. Most correlations in the second group are scarcely significant, with regard the mere impact of collaboration on innovative performance. Firms from the first cluster- firms for which collaboration is the most valuable method - generally have better innovative performance than the second cluster. Second cluster identifies general patterns of collaborative innovation. We can distinguish five different patterns of openness for innovative firms, as displayed in table 5:

Tab. 6: Openness and patterns of collaborative innovation

Intensity of collaboration	Type of collaboration
Basic	<i>Collaborations with firms within enterprise group</i>
Low	<i>Collaborations with firms within enterprise group and with competitors or other enterprises of the same sector</i>
Moderate	<i>Collaborations with customers from the private sector, with other enterprises within the enterprise group and with competitors or other enterprises of the same sector</i>
Medium	<i>Collaborations with customers from the public sector, with other enterprises within the enterprise group, with competitors or other enterprises of the same sector and with customers from the private sector</i>
High	<i>Collaborations with suppliers, with customers from the public sector, with other enterprises within the enterprise group, with competitors or other enterprises of the same sector and with customers from the private sector</i>

Source: our elaboration

Firms for which collaboration is the most valuable method tend to search for collaborations largely and to extend their span in depth and breadth. As far as openness increases, so does innovative performance.

Second, firms from the first cluster prefer to co-develop product innovation with clients. Differently, service innovation seems to require also collaboration with suppliers. This finding seems to largely confirm our main hypothesis, the hypothesis 4: firms co-design the meaning of products with their customers (e.g. aesthetics and packaging). The more complex and technology-intensive is the innovation, the broader is the span of collaboration required. Thereby, whether a firm does open innovation, closed innovation or both of them, we acknowledge the presence of a firm-client-supplier collaborative pattern. Also, this pattern occurs in either marketing or organizational innovation. Collaborative innovation with clients is rather frequent in innovative and open firms, especially when they search for marketing innovation. In fact, results confirm that firm collaborates with client when it is going to introduce significant changes to the aesthetic design or packaging, new methods for product placement or new pricing methods. Additionally, we find that the most probable outcome of collaboration with clients is incremental innovation. Differently, radical innovation often is co-designed with suppliers. One explanation for current results rely on the firm's need for meeting customers expectation. A little effort could improve financial performance brilliantly, whereas not following customers' guidelines could determine a void in innovation meaning that can be easily and timely covered by rivals. The negative consequence of clients discontent could be such that financial performances decrease sharply. The recent launch of the Iphone X by Apple is a practical example of what has been said. Also, collaboration with clients is deemed to be a funnel for gathering a reservoir of heterogeneous knowledge and a driver for creativity. Besides, collaboration with clients brings the further benefit that is almost costless. Though, as supported by current empirical analysis, rarely this way of gathering new knowledge leads to disruptive innovations. By contrast, it seems that it could produce more newness rather than ground-breaking novelties. Thereby, if the firm's intent is to disrupt the market, then it has to go for broader alliances at technology level. Nevertheless, the innovative meaning definition appears as ultimately left to customers' hands. Open innovation seems to have had open up to a new domain for meaning design in innovation. For far too long, clients' involvement was limited to feeds-back on the good or to marginal changes, mostly aimed to increase clients loyalty and engagement. Lately, the new open paradigm for innovation led the firm itself to be engaged with clients' more intimate desires to the point that this priceless source is directly deployed onto the forefront of innovation development. By harnessing and internalizing people creativity the firm's reach goes far beyond its borders. Collaborative innovation with clients is the future means for producing novelties which have the inherent characteristic of generating a differentiated meaning, and, thus value, per final user. The other interpretation of results goes far beyond the business horizon, since its meaning is attached to the cultural revolution occurring at societal level. We can definitely say that open innovation is becoming so much "normal" that is a rather expected organization's behavior.

The involvement of customers is no longer limited to lead users and early adopters, by contrast it embraces every user in the community willing to express his/her opinion. In other words, users can exercise a strong influence on organizations. The influence is such that their opinion ought to be taken into account at any costs. This condition, coupled with the massive diffusion of digital technologies, led firms to favor, for a vast array of reasons, the collaborative innovation with clients over all other forms (as confirmed by our findings). We find that the marker of uniqueness is designed (and, often, re-designed lately) at a meaning level, during the phase of the conceptualization of the product. We argue that this revolution is only driven for a small part by technology. By contrast, the main motivation is the new imperative societal *weltanschauung*. In a nutshell, it is not due to technological constraints, or profit motives, but to the cultural *diktat*. In this sense, the digital co-design of innovation meaning can be deemed as the new economic paradigm informing today society.

4.5 Limitations of the analysis

At large, cross-sectional studies have some main limitations. First, this type of investigation does not give any information on which is the cause and which one is the effect. Plus, there can be some confounding factors. The research question itself can bias results of the analysis, whereas longitudinal studies might help to reduce such type of biases. Since this cross-sectional study aggregates individual-level data, there can be some negative effects related to ecological fallacy and atomistic fallacy. As a consequence, a relationship that does not surface at group level may still exist at individual level. As the advantage, this study does not assume that the relationship is stable over-time.

4.6 Relevance and originality of the study: managerial and practical implications

This study fulfills the resounding literature gaps earlier underscore, by bringing such the advancements in the understanding of open innovation collaboration ends, impact and dynamics.

First, we propose a new ontological interpretation of the essence of collaborative innovation with clients, in terms of meaning co-development to serve the societal need for individualism.

Second, we study the epistemological dimension of collaborative innovation with clients. This way we answer to prior relevant calls for research in this field (West *et al.*, 2014; Bogers *et al.*, 2017). Furthermore, we find evidences that contrast with prior researches, which underestimate the effects of collaboration with clients (Un *et al.*, 2010). By contrast, our findings turn upside-down these results. Reliability of results is ensured by the size and characteristics of the sample. CIS survey was largely employed from prior scholars to study innovative performance of firms, openness and open innovation (Laursen and Salter, 2006; Mention, 2011; Ebersberger *et al.*, 2012). Additionally, the use of CIS data answers to the call for replicability of studies. At practical level, our study can be used as a beacon to enlightening how to set strategy openness, how this would impact performance, and as a means for choosing innovation partnerships optimally.

4.7 Suggestions for future investigations

Future scholar are called to perform more in-depth analyses on this topic. We not only refer to quantitative investigations. Qualitative methods, such as case study, could be of help when trying to catch the deep meaning and dynamics of collaborative innovation mechanisms and how they interplay with customer needs. Among future roadmaps for research, we identify the following questions:

- How does collaborative innovation with clients process up?
- Is there any sector where it is particularly valuable, more than elsewhere?
- What are technologies fostering collaboration with clients?

- Which is the theory -as instance contract theory, neo-institutional theory, organizational theory, etc. - that better frames collaboration with clients?
- Which are, in detail, the negative effect of developing an innovation regardless the need for differentiated meanings?

Such suggestions are just a small portion of the many future research domains this study opens up to. Perhaps, even a multi-disciplinary approach could be of help to explain this phenomenon.

5. Concluding remarks

The new societal culture is simultaneously selfish and selfless. It demands for high-tech solutions and for a continuous gale of innovations and renovation. From the verge, individualism has surged to the frontline of each and every decision. Effectiveness of firm innovation strategy cannot disregard the wind of change we are witnessing: a firm ought to satisfy the sense for selfish fulfillment of customers via a selfless collaborative approach. Though, collaborative innovations are an extremely complex phenomenon. Current analysis dig to light the relevance of collaboration with clients for innovative performance of firms.

We argue that the customer is the sovereign of the realm for meaning-definition. It is hard to forecast what the future modes of innovation and effects for intellectual properties will be. A huge scholars' effort and commitment is requested for portraying the next paradigmatic behavior in innovation.

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