Sensemaking, sensegiving and sensebreaking

The case of intellectual capital measurements

Marco Giuliani
Department of Management,
Università Politecnica delle Marche, Ancona, Italy

Abstract

Purpose – The purpose of this paper is to investigate how organizations make sense of and give sense to intellectual capital (IC) measurements, i.e. to analyse the sensemaking, sensegiving, and sensebreaking processes with reference to IC measurements. In order to achieve this aim, a case study, developed adopting an action research approach, will be presented.

Design/methodology/approach – This study is based on a case study for which an interventionist research method was adopted.

Findings – The main findings are the following. First, the development of an IC project requires the development of an intense sensemaking and sensegiving activity as the managers of an organization need, first, to make sense of this new object (i.e. assign it a meaning) and of the consequent new managerial practices and, second, to diffuse the sense of IC and of its measurements within the organization. Second, the development of an IC project can be seen as a series of different types of sensemaking micro-processes (guided, fragmented, restricted, etc.) and each of them can lead to a different outcome of the practice of measuring IC; thus, it seems possible to argue that the outcome of the project depends on the specific type of sensemaking/sensegiving adopted in each phase (e.g. lock-in, mobilization, etc.). Third, it emerges that IC can be a sensebreaking device, i.e. existing measurements introduced in an "IC box" can acquire different meanings. Finally this study underlines the relevance of the "leaders" within the development of IC sensemaking processes and the related outcomes.

Research limitations/implications – The main limitations of this study are twofold. The first is related to the methodology adopted and to its specific pros and cons. The second is related to the specificities (size, managerial approach, etc.) of the case examined. This paper contributes to the extant literature regarding the production and use of IC measurements "in practice" as it highlights what happens when an IC measurement system is implemented. Moreover it contributes to the development of a "theory of indicators" as it suggests aspects regarding how IC indicators are interpreted. Finally, the paper adds to the growing stream of analysis dedicated to the micro-processes of sensegiving and other sensemaking patterns, i.e. to the studies focused on how measurements are "shaped" "through the creative oral intertwining of accounting and other organizational knowledge".

Originality/value – Differently from the extant literature, this study does not adopt a theoretical perspective on how measurements are designed and used but is aimed at investigating how these measurements are designed and used "in practice". Moreover, this study analyses the use of IC measurements focusing specifically on the micro-processes of sensemaking, sensegiving, and sensebreaking that tend to be overlooked. In other words, this study examines sensemaking processes related to IC measurements, i.e. the sensemaking of IC measurements and by means of IC measurements. Finally, this investigation considers the different types of sensemaking processes in order to interpret the different outcomes of measuring IC.

Keywords Sensemaking, Sensegiving, Measurements, Intellectual capital, Sensebreaking

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1. Introduction

Accounting measurements (numbers, metrics, and indicators) as such are "neutral", i.e. they do not have any inherent or embodied meaning. These measurements acquire a specific meaning in and through daily "accounting talk" developed by their users

(Ahrens, 1997; Andon *et al.*, 2007; Preston, 1986). Even if this process of giving sense to accounting measurements appears to be particularly relevant, very few studies have specifically examined, through a practice lens, how managers use, make sense of, and give sense to accounting numbers in order to manage the organization (Ahrens and Chapman, 2007; Hall, 2010; Jönsson, 1998). Therefore, there emerges the opportunity to investigate the processes of sensemaking, sensegiving, and sensebreaking in practice with reference to accounting measurements (Ahrens and Chapman, 2007; Almqvist *et al.*, 2011; Catasús *et al.*, 2009; Hall, 2010; Jönsson, 1998).

An emerging type of accounting numbers and metrics is represented by intellectual capital (IC) measurements, i.e. IC indicators and values. In fact, there is, both in literature and in practice, increasing attention placed on IC as it is generally recognized that its performance contributes to improving the firm's overall performance (Guthrie *et al.*, 2012). Although there is a strong belief in the possibilities of using measurements for managing organizations (Catasús *et al.*, 2007), both academics and practitioners have questioned the actual use of IC measurements in the "real" world. More in depth, several researchers have started contributing to the stream of studies on "IC in practice" that focuses on what happens when IC is brought into an organization (Dumay, 2013; Guthrie *et al.*, 2012).

Within the IC literature, there is a growing stream of research that aims to investigate how managers make sense of IC in order to intervene adequately, i.e. how managers move from "measuring" to "understanding" and on to "managing". Some scholars have delved into this issue, making reference to the Latour's ideas of ostensive and performative dimensions, to the adage "you can manage what you can measure", to the "lock-in" phenomenon, to Kolb's experiential learning theory model, etc., in order to understand how measuring IC can favour IC mobilization (Catasús *et al.*, 2007; Chaminade and Roberts, 2003; Chiucchi, 2013; Chiucchi and Dumay, 2015; Dumay and Rooney, 2011; Mouritsen, 2006). One lens that can be used to understand this aspect of IC measurements is sensemaking/sensegiving/sensebreaking. Even if traces of the idea of "making sense" of IC indicators can be found in some of the studies mentioned, it does not seem that it has explicitly been the object of investigation using a sensemaking, sensegiving and sensebreaking framework which is specifically focused on how managers justify a practice, i.e. how they "make sense" of the reality in order to make decisions (Almqvist *et al.*, 2011; Catasús *et al.*, 2009; Gioia and Chittipeddi, 1991; Maitlis, 2005; Pratt, 2000; Weick *et al.*, 2005).

This study aims to answer to the call for case studies on IC "in practice" (Dumay, 2013; Guthrie *et al.*, 2012) and to contribute to the research on the accounting micro-processes of sensemaking, sensegiving, and sensebreaking in order to understand how accounting numbers acquire meaning and how they can support the decision-making process (Ahrens and Chapman, 2007; Almqvist *et al.*, 2011; Catasús *et al.*, 2009; Hall, 2010; Jönsson, 1998; Tillmann and Goddard, 2008). Thus, the purpose of this study is to investigate how organizations make sense of and give sense to IC measurements, i.e. to analyse the sensemaking, sensegiving, and sensebreaking processes with reference to IC measurements. It is argued that a better understanding of how IC measurements represent and construct reality can help further the understanding of their different use in practice, i.e. the "success" or "failure" of IC measurements. In order to achieve this aim, a case study in which an action research approach was adopted, will be presented.

The structure of the study is the following. The next section proposes a brief review of the literature on the basic elements of the study. Then, the empirical part will be illustrated in terms of methodology and data collected. In the central part, an attempt

will be made to make sense out of the findings and to develop the theoretical arguments of the study. Finally, some valuable insights are extracted and systematized to draw some conclusions and to outline a future research agenda.

2. Sensemaking, sensegiving, sensebreaking, and IC measurements: the state of the art

Measurements can be seen as a means of communication, i.e. "a process by which information is exchanged between actors through a system of symbols" (Almqvist *et al.*, 2011, p. 131). Nevertheless, in management accounting studies the production of information (measurements) has always predominated over the use of information and consequently, the communicative aspects tend to be overlooked (Almqvist *et al.*, 2011). From this perspective, measurements can be seen as "short-cuts" to organizational reality and therefore they enable managers to visualize, understand, and influence the organizational performance; this finds one expression in the popular management adage "if you can't measure it, you can't manage it" (Kaplan and Norton, 1992).

In line with this view, some scholars started investigating the micro-processes of sensemaking, sensegiving, and sensebreaking and their relationships with managerial measurements (Ahrens, 1997; Almqvist *et al.*, 2011; Catasús *et al.*, 2009; Maitlis and Christianson, 2014).

Sensemaking can be defined as a process of assigning meaning to events in the environment, by applying stored knowledge, experience, values, and beliefs to new situations in an effort to understand them (Gephart, 1993; Thomas *et al.*, 1993; Weick *et al.*, 2005). Sensemaking is about people's attempt to understand past, present, and future situations; it depends on one's understanding of what happened and one's ability to lead future activities (Tillmann and Goddard, 2008; Weick *et al.*, 2005). It can be referred to as "understanding the situation", "being informed", "knowing where the organization is going", and "getting the picture" (Hasan and Gould, 2001). Sensemaking as a cognitive phenomenon is an everyday occurrence that happens inside an individual's head when s/he "makes sense" of something. In contrast, sensemaking as a theoretical perspective is much more complex than sensemaking as a cognitive phenomenon because it not only considers the individual level of meaning but also the relational, the group, and the societal levels of meaning (Weick *et al.*, 2005). This process involves justifying/legitimizing a practice within an argumentative or linguistic context (Green, 2004). In summary, sensemaking can be seen as an infrastructure of the decision-making process or as an approach that serves to explain decision making and action: you make sense of reality and, on the basis of that reality, you start doing things. Some scholars have pointed out that managers, consciously and unconsciously, undertake sensemaking activities every day in order to understand situations and construct meanings for themselves which also influence other organizational participants' sensemaking. This can happen when they define strategies, control the achievement of the organization or disclose results to the stakeholders (Tillmann and Goddard, 2008).

The concept of sensemaking has been extensively discussed in diverse managerial fields, such as, strategy, organization, change management, etc. (Gephart, 1993; Gioia and Chittipeddi, 1991; Gioia and Thomas, 1996; Hasan and Gould, 2001; Hill and Levenhagen, 1995; Maitlis and Christianson, 2014; Steinthorsson and Söderholm, 2002; Weick *et al.*, 2005), but relatively less so in the accounting literature (Ahrens and Chapman, 2007; Hall, 2010; Jönsson, 1998; Tillmann and Goddard, 2008).

Research in the accounting field has shown that there is a process of making sense of numbers, i.e. giving meaning to numbers, through daily "accounting talk" developed by their users (Ahrens, 1997; Andon *et al.*, 2007; Boland, 1993; Preston, 1986) and that, at the same time, measurements can function as sensemaking devices, i.e. they can help to move from an individual dimension of sensemaking towards an organizational one as they can serve as a bridge in the establishment of a common interpretive scheme of new phenomena (new organizational concepts, new strategic dimensions, etc.) (Arroyo, 2012; Boland, 1984; Boland and Pondy, 1983; Denis *et al.*, 2006; Jönsson, 1987; Jordan and Messner, 2010). In brief, some argue that sensemaking is at the same time sensemaking of measurements and by means of measurements because it originates from the peculiar qualities of the measurement as well as from the context in which the measurement is enacted (Jordan and Messner, 2010).

Sensegiving, is defined as "attempting to influence the sensemaking and meaning construction of others towards a preferred redefinition of organizational reality" (Gioia and Chittipeddi, 1991, p. 442). The term was created to understand management's role in the sensemaking process (Catasús *et al.*, 2009): in fact, if sensemaking is related to the idea of identifying justifications, then sensegiving refers to that of diffusing justifications within an organization (Green, 2004). Sensegiving helps to normalize and legitimize certain organizational realities while delegitimizing others (Gioia and Thomas, 1996). The process of sensegiving "shuts down alternative interpretations of reality, constrains sensemaking, and limits who can participate in the sensemaking process" (Voronov, 2008, p. 201).

Regarding the relationship between sensegiving and sensemaking within the accounting field, it seems that there is no coherent idea of how sensegiving should be carried out in order to affect the sensemaking processes of human resources. More in depth, while some argue that it is possible to influence the receiver of a measurement by acting on the "production" (design and calculation) of the measurement itself, others believe that "the fate of the number lies in the hands of the receiver. Here, sensemaking is ultimately seen as a process in which sensegivers (i.e. accountants, managers or accounting models) cannot control the outcome of the numbers reported" (Catasús *et al.*, 2009, p. 174). In sum, the concept of sensegiving recalls the fact that numbers and measurements are not at all a "neutral representation" (Robson, 1992, p. 701): since they allow action to be performed at a distance, their choice takes on a very high significance for those who are willing to act at a distance as well as for those who are situated in the context that the numbers represent.

The concept of sensebreaking (or sense unmaking) highlights the ways organizational members must break down sense in order to give sense (Almqvist *et al.*, 2011). It involves the "destruction or breaking down of meaning" (Pratt, 2000, p. 464). Sensebreaking occurs when a person's process of sensemaking is disrupted by contradictory evidence, i.e. it is concerned with breaks in the scanning, interpretation, and learning dynamics of the sensemaking process. Sensebreaking actions take place in the form of questioning, reframing, and redirecting and it can lead to positive evolutionary or learning scenarios, or rather, to failures (Almqvist *et al.*, 2011; Dervin, 1998; Maitlis and Christianson, 2014; Vlaar *et al.*, 2008).

In summary, while sensemaking relates to the idea of understanding and sensegiving to that of influencing, sensebreaking can be referred to the concepts of change and destabilization. In other words, sensemaking regards the identification of justifications of a specific phenomenon; sensegiving regards the diffusion of a justification among the members of an organization while sensebreaking is related to the adoption of new justification.

As mentioned, the object of this study are IC measurements. In the last few decades, both scholars and practitioners have tended to follow mantras like "a new object needs new measurements" (Stewart, 1997) or "you manage what you measure" (Kaplan and Norton, 1992). A plethora of IC measurements which differ from one another by hypotheses, objects, and formulas considered (Andriessen, 2004; Guthrie *et al.*, 2012; Sveiby, 2004) have been proposed, which, to date, appear to have been implemented in very few organizations.

IC measurements can be referred to two main streams of studies (Brännström *et al.*, 2009): the first focuses on IC disclosure while the other adopts a management accounting/control approach. This study focuses on IC measurements from a management accounting/control perspective, i.e. on how IC measurements are designed and implemented to support the everyday managerial decision-making process.

Some argue that IC measurements should try to reliably represent the underlying phenomenon that they purport to. In other words, IC measurements can be seen as devices that are useful to visualize and understand what IC is (Edvinsson and Malone, 1997; Grasenick and Low, 2004; Meritum, 2002). Conversely, some argue that measurements do not only report a specific phenomenon but they also contribute to its construction; this means that the focus is not on the measurements *per se* but on what IC measurements can do, on which kind of learning and managerial processes they can activate (Catasús *et al.*, 2007; Catasús and Grojer, 2006; Chaminade and Roberts, 2003; Dumay, 2012; Johanson *et al.*, 2001; Mouritsen, 2009). In summary, with reference to the use of IC measurements it seems possible to identify an idea of numbers both as means for understanding the reality and as devices for constructing, influencing, and managing the reality. It is in this context that sensemaking processes become particularly relevant.

More in depth, research has shown that measuring IC helps people make sense of it and shape the reality, making it feasible to re-configure a possible future (Dumay and Rooney, 2011; Mouritsen, 2006). In addition, research has shown the importance of IC remaining "ambiguous", since it is more likely that managers will make sense of it and engage with it by applying it to corporate concerns. In this way, IC can be enacted and used as a solution to practical issues (Dumay and Rooney, 2011; Llewellyn *et al.*, 2007). Moreover, the combination of IC measurements with narrative makes it possible to establish IC boundaries and furthermore, IC meaning in the specific organizational setting is expressed, the indicators are interpreted and, in this way, reality is "built" and the organization's future begins to be shaped. Finally, IC measurements can activate learning processes useful to understanding how IC works in practice (Chiucchi, 2013; Dumay and Rooney, 2011) and prevent the rise of intellectual liabilities (De Santis and Giuliani, 2013; Giuliani, 2013).

Compared to the extant literature, this study does not adopt a theoretical perspective on how measurements are designed and used (Mouritsen, 2006, 2009) but is aimed at investigating how these measurements are designed and used "in practice" (Dumay, 2013; Guthrie *et al.*, 2012). Moreover, this study analyses the use of IC measurements by focusing specifically and explicitly on the micro-processes of sensemaking, sensegiving, and sensebreaking that tend to be overlooked (Ahrens and Chapman, 2007; Almqvist *et al.*, 2011; Catasús *et al.*, 2009; Hall, 2010; Jönsson, 1998). In other words, this study examines sensemaking processes related to IC measurements, i.e. the sensemaking of IC measurements and by means of IC measurements. Finally, this investigation considers the different types of sensemaking processes (Maitlis, 2005) in order to interpret the different outcomes of measuring IC.

3. Design of the study

This research is based on a case study. The case study method was chosen as an appropriate means of exploring the research question since it allows us to collect "rich data" and to answer "if" and "how" questions (Yin, 2003). This approach allows the potential discovery of new conditions and interactions that could significantly contribute to understanding how organizations make sense of and give sense to IC measurements.

In order to propose a study that can also contribute to bridging the gap between theory and practice in management accounting (Llewelyn, 2003; Scapens, 1994, 2006), this paper is focused on the empirics of practice, as this allows understanding organizational phenomena as dynamic and accomplished in on-going, everyday actions (Ahrens and Chapman, 2007; Feldman and Orlikowski, 2011; Reckwitz, 2002).

This paper examines the Mech case study, which was undertaken using an "action research" methodology (Dumay, 2010; Jönsson and Lukka, 2005). Action research is based on a collaborative process between the researcher and client, with a critical inquiry into the problems of social practice in a learning context (Argyris *et al.*, 1985; Coghlan and Brannick, 2001). In other words, action research requires a real issue of both research and managerial significance upon which the organization is embarking that has an uncertain outcome. Thus, the organization must be willing to be the subject of rigorous inquiry, thereby enabling the undertaking of a "live" case study in real time (Adams and McNicholas, 2007).

This research methodology was chosen for this study because it allows scientific research and innovative practical solutions to be developed (Kaplan, 1998; Kasanen *et al.*, 1993; Labro and Tuomela, 2003). This methodology allows the researcher to take part in the project, to access and collect "rich data" and to understand more in depth the context, of the variables, and of the process under analysis (Labro and Tuomela, 2003; Middel *et al.*, 2006). Finally, an interventionist method was chosen because, in accounting studies in general and in the IC literature in particular, there is a strong call for case studies to be developed with this methodology in order to test and observe concepts, methods, and tools in practice (Dumay, 2013; Marr and Chatzkel, 2004; Mouritsen, 2006). All in all, the main advantages of this approach are related to the possibility for the researcher to gain more valuable insights as an active participant, rather than as a non-participant observer, and to expand the case study methodology by collaborating with the organization in developing real solutions to problems; through this approach, the researcher is able to make both a theoretical contribution and an organizational one by assisting organizations in implementing change (Dumay, 2010).

Mech was deemed an appropriate subject for this study, for several reasons. First, Mech's management is focused on IC: it strongly believes that the company can compete and survive in the market only by creating value-added products, and that this is only possible through its personnel. Second, Mech allowed the researcher to take part in meetings where the measurements were discussed, thus offering an opportunity to experience a process "in vivo" instead of merely seeing it "in vitro", as usually happens.

As for data collection, it was mostly done through participant observation, i.e. by taking part "in real time" to the meetings of the focus group. A focus group is a group of people that meet in an informal setting in order to discuss a specific topic usually proposed by the researcher who also plays the role of facilitator, meaning his duty, without being directive, is to keep the discussion focused on the topic and to allow the members of the group to explore the topic from as many different perspectives as they please (Wengraf, 2001, p. 103). In Mech, the focus group was established by the CEO and

consisted of the researcher, the CFO, the area managers, and the CEO himself. The focus group meetings were based on a semi-structured agenda proposed by the participating researcher, discussed with the CEO and the CFO, and then modified for use. There were five such meetings that lasted about four hours each. Based on the specific requests of the CEO and of the CFO, the researcher supported Mech's management in coordinating and supporting the discussions and development process needed to design and implement the system. In all, during the meetings of the focus group the researcher offered a scientific point of view and a methodological support that helped the company to develop a practical solution that is the result of the combined efforts, expertise, and knowledge of both the practitioners and the researcher.

In addition to the data collected during the focus group's meetings, semi-structured interviews were carried out. Semi-structured interviews were selected as an additional means of data collection because they are well suited for the exploration of the perceptions and opinions of respondents regarding complex and sometimes sensitive issues and they also allow the interviewer to probe for more information and elicit clarification of answers. In this situation, although a list of questions to submit to the interviewee is prepared beforehand, "the interview unfolds in a conversational manner offering participants the chance to explore issues they feel are important" (Wengraf, 2001, p. 103). In this study, the main interviewees were the CEO, the CFO (who was in charge, *ad interim*, of the HR and IT departments), the area managers, the purchase manager, the R&D manager, the design manager, the production manager, and the employees responsible for specific activities that were relevant for the project. Approximately 15 interviews lasting about one-and-a-half hours each were carried out and some shorter meetings were held to clarify or confirm aspects that had emerged during the interviews.

However, multiple other sources were also used, such as annual reports, stakeholder impact reports, internal strategy reports, etc., as required by an action research project (Rock and Levin, 2002).

4. The Mech case study

In order to investigate the sensemaking-sensegiving-sensebreaking process, the empirical part of the present paper is organized as follows. The first part describes the process with reference to the whole IC project in order to highlight the different moments of sensemaking; the second part, dedicated to IC indicators, adopts a sensemaking lens and focuses on IC indicators in order to highlight how the meaning of indicators can change over time when framed differently.

4.1 The IC project

The case study under investigation is a manufacturing company that is a "newcomer" in the IC discourse, i.e. a company that has only recently introduced the concept of IC and implemented an IC measurement system.

The management accounting system of Mech was mainly based on financial indicators; non-financial indicators were used only for limited and specific aspects such as the control of the production process and the analysis of the customer satisfaction. In all, IC was not monitored, except for specific dimensions (e.g. customer satisfaction or turnover of the employees), and the focus was on financial measures; thus, the introduction of IC measurements represented a "big step" as it implied the introduction both of a new accounting object and of non-financial measures.

In Mech the IC project was promoted by the CEO and the CFO in order to:

> […] have a picture after 20 years of history and have a measurement of the value achieved by the company thanks to our people, our customers, our organisational model, and our business idea […] (The CEO).

In the minds of the CEO and the CFO this IC accounting system was supposed to be (at least at the start) a tool specifically designed for their own purposes and use, i.e. the server organizational functions (marketing, production, etc.) were just supposed to produce the necessary data but they were not supposed to use the output of the system. The reasons for this choice were twofold. First, and this was the initial perspective, the CEO and the CFO wanted to have "a picture" and not something to influence behaviour and/or control the organizational performance. Second, and this is the reason that emerged afterwards, even if they appreciated the potentiality of the system, before sharing the output with the whole organization, i.e. put it completely into "action", they wanted to have some time to dedicate to testing and refining it, for there was no perceived urgency for its implementation.

After having defined the aim of the project, the first step was to achieve a consensus on the meaning of the term "IC". According to the aim of the research project, the researcher proposed to define IC as the system of intangibles that have strategic relevance (Meritum, 2002). This definition was then discussed:

> I think this definition is ok as it allows us to focus on the "pluses" we have (The CEO).

> Wouldn't it be better to consider all the intangibles we have? (An area manager).

> I agree with the CEO: we should focus on the resources that have a value for us and on which we are investing […] we have to be selective as we do not have information on everything (The CFO).

The discussion was the first moment of sensemaking, as here the managers (mainly the CEO and the CFO) tried to identify a justification for the chosen definition. After this moment, according to the directives of the CEO and the CFO, IC was always defined within the whole organization according to the definition chosen by the members of the focus group. This represents a case of sensegiving.

To support the managerial activity and according to the Meritum Guidelines (2002), the researcher proposed focusing both on IC resources and on IC activities. This proposal was discussed and then accepted by the project group because it was considered appropriate to monitor both the efforts made (activities) and the results achieved (performance) in order to obtain the desired "picture" of the IC of the company.

Starting from the company's strategic targets, the resources were mapped adopting a cause-and-effect approach based on the perceptions of the members of the focus group. By way of example, to achieve the desired level of technical know-how they needed to have qualified and stable human resources supported by an up-to-date information system and specific technologies, databases and processes, i.e. specific IC resources, tangible, and financial resources. Afterwards, the focus group identified the activities they deem useful to create and develop the mapped resources. Once the IC resources and activities were identified, the Meritum tri-partite model was adopted to facilitate the identification and visualization processes. The results of this stage are shown in Table I.

Also in this case, the discussion regarding the identification of the IC resources and activities can be seen as a sensemaking process. The managers identified generally acceptable justifications to explain Mech's competitive advantage.

Human capital	Structural capital	Relational capital
Resources		
Design competences	Procedures	Relationships with customers
Die-casting competences	Manuals	Relationships with suppliers
Production competences	Database	Relationships with the institutions
Loyalty	Strategic software, etc.	Brands, etc.
Quality of the workplace relationships		
Activities		
Training activities	Renewal activities	Marketing activities
Coaching activities	Maintenance activities, etc.	Activities with suppliers
Retention activities		Activities with the institutions, etc.
Team-building activities, etc.		

Table I.
Mech IC resources and activities

After the visualization, the group moved on to consider the design of a panel of indicators that would be able to monitor IC performance, as well as the activities carried out to create or develop IC. The idea of focusing on both resources and activities was suggested by the researcher in accordance with the Meritum model. The focus group discussed and then accepted it, because it was considered appropriate to monitor both the efforts made (activities) and the results achieved (performance), effectively combining the static and the dynamic approaches.

The researcher proposed an initial selection of indicators to the focus group. The discussions regarded both the structure of the panel (analytical vs synthetical) and the calculation/relevance of the single indicators.

With reference to the first aspect, the CEO was more oriented towards having "a number" that expressed the IC value, while the CFO was more oriented towards having several indicators in order to provide a complete picture rather than a synthetic one; his thinking was that since IC is a multi-dimensional phenomenon, not having enough indicators could be misleading and could allow ambiguous interpretation by the CEO himself:

> The entrepreneur will look at the indicators, so in the report we will describe what happens, to be sure that all the IC policies and elements are well explained and clear […] (The CFO).

In other words, the CFO wanted to avoid the risk that the panel would offer a "wrong" representation of the reality. Here there emerged the idea that indicators should offer a "neutral" representation of the underlying reality but, instead, they tend to offer a representation of the reality as it is perceived by some specific individuals, such as the CFO.

The panel of IC measurements was initially proposed by the CFO, discussed and modified by the other members of the focus group, and then implemented over a three-year period (2006-2008). The data were partly extracted from Mech's information system and partly collected through interviews, questionnaires, etc. Some of the indicators are shown in Table II.

More details about the design and sensemaking of IC measurements are proposed below.

After the implementation of the indicators and based on the visual cognitive aids for managers proposed in literature, a map was designed to aid the understanding of IC in action (Cuganesan, 2005; Cuganesan and Dumay, 2009; Giuliani, 2013; Marr *et al.*, 2004). The map was built using a qualitative approach. The choice of this approach was made for two main reasons. The first was that this approach is particularly advantageous for creating visual maps in the early stages of investigating complex processes when more

Human capital	Structural capital	Relational capital
Resources		
Level of design competences Level of die-casting competences Level of production competences Level of managerial competences Labour costs for design, die-casting and production processes Number of people with critical competences Turnover index Quality of the workplace index, etc.	No. of quality/environment procedures Rating of the procedures (usefulness, size, update rate, timeliness of updates, etc.) No. of databases for each type (design, production, marketing, etc.) Size of databases Rating of the databases (usefulness, size, update rate, timeliness of updates, etc.) Investments in strategic/non strategic software, etc.	No. of relevant and loyal/other customers Customer loyalty index Customer profitability for each category No. of strategic supplier in Europe, South America, Asia, USA Cost savings generated by strategic suppliers Supplier loyalty, etc.
Activities		
Costs and time of training activities Costs and time of coaching activities Costs and time of recruitment activities Costs and time invested to guarantee horizontal mobility, etc.	Index of renewal of the procedures/databases Investments in procedures/databases IT investments in strategic software, etc.	Marketing investments Investments to develop existing/new customers for each category No. of sustained audits No. and investments in fairs No. of visits to suppliers No. and value of sponsorships Brand investments No. of improvement plans, etc.

Table II.
Mech IC indicators

objective data are not available. The second reason was that it was impossible to identify statistically relevant relationships between the indicators (Abernethy *et al.*, 2005).

In order to draw the map, the researcher systematized all the evidence from previous meetings regarding the perceived connections between IC resources. Then he drew a preliminary version of the map, which was discussed by the focus group and modified in order to define the final version. The idea of combining the perception of the researcher with that of the members of the group emerged from a desire to reduce the subjectivity of the mapping and an awareness of the risk of miscoding or misunderstanding (multi-method approach) (Abernethy *et al.*, 2005). The resulting map is presented in Figure 1.

The group decided to focus on those relationships perceived to be the most stable and strategically relevant in order to have a simpler and clearer visualization of them. They also wanted to concentrate on the linkages that were more likely to have an influence on the value creation process. By way of example, customer relationships were seen to have a direct and highly probable impact on financial performance and therefore this item was included in the map. The influence of the company brand on its human capital was not drawn because, although perceived as existing (the company has a good brand and reputation which facilitates the recruitment of qualified technicians and personnel), it was considered less stable and it was not clear whether and how it was possible to manage it. The map can therefore be considered an interpretation of the business model adopted by the company and of the connections between IC and financial performance.

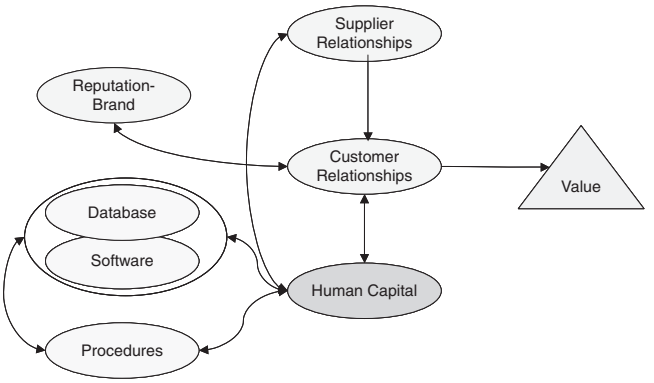

Figure 1.
Mech's perceived value creation (potential cause-and-effect) map

By drawing the map, discussions about the indicators took place. Frequent comments included:

> Why do the indicators show an increase/decrease this year? Maybe it's because "n" years ago we did […] (The members of the focus group and in particular the CEO & the CFO).

> Look at the data […] Thanks to this new process we increased our cost savings by 30% in 1.5 years (The CFO).

> Look here! The implementation of this software took us a lot of time but now we don't need anyone to do data input any more, and it also allows us to monitor the production process in real time and therefore to reduce mistakes and to save time […] so the project was worthwhile (The Production manager).

> The marketing investments we made in Asia took longer than we thought to start producing income but they are much higher than we expected. That's probably because […].

In summary, the combination of the IC indicators and of the designed causal map allowed the members of the focus group to make sense of the company's IC or better, of what IC does. In particular, the process made it possible to justify projects and practices through concrete and shared data, whereas previously, this justification had been mainly based on perceptions.

4.2 A focus on IC measurements

In order to investigate the sensemaking-sensegiving-sensebreaking process, in this part the collected evidences regarding the IC measurements are presented.

As mentioned, the panel of IC indicators was proposed by the CFO and modified by the other members of the group, in order to:

- exclude indicators which were not possible to calculate from the existing information system;
- modify some of the proposed new indicators in order to make them more fitting to the organizational context; and
- include some indicators which were already in use, considered useful but presented in internal reports almost as "stand-alone data", such as the index of workplace quality.

Different sensemaking processes can be identified which distinguish the ones related to the "new" measurements from the ones referred to the indicators which were

already in use. With reference to the new indicators, the focus group had to balance the desire to design "the best indicator" with the potential of the information system and the capabilities of the organization to run the measurement over time. For example, in order to measure the level of competences the best method identified was to carry out structured meetings between managers and employees and hold assessment sessions. Nevertheless, on second thought, some of the managers considered these methods too complicated to be applied as they did not have "the competences to judge" or "a place where the evaluations could be recorded". Therefore, a second-best solution was adopted.

Apart from the technical aspects of the design process, it is interesting to analyse the sensemaking process with reference to some of the new measurements. A first example is offered by the discussions regarding the measurements related to the item named "IT integration":

> The CFO and the CEO: it is very important for us that our IT is integrated with that of our branches abroad. We should measure this […] but how?
>
> The CFO: we should design one or more indicators that show that working in our branches is like working here [the headquarters] as they have the same technology.
>
> The CEO: that is right, some of our competitors give old technology to their branches or they are not integrated, i.e. they don't know what is going on there. We can follow the production process of our branches in real time […] Moreover the people that work in our branches should be able to realize products with the same quality as the ones realized here since they have the same technology. The indicators should show this […] Investment in IT is not a "good" indicator otherwise the IT manager can interpret it as "the more I spend the better it is" […].

At the end of the discussions, the following indicators were chosen as the most representative of the idea that managers had of "IT integration": the percentage of software installed Group-wide, the percentage of strategic software installed Group-wide, the percentage of files shared by the whole Group, and lastly, the number of non-working hours put in because of IT network problems.

Another example indicator is the one dubbed "integration with suppliers" proposed by the CEO and some of the other managers:

> The CFO: What is the meaning of this indicator?
>
> The researcher: the idea of this proxy is to highlight how close the relationship is with your strategic suppliers […] if it is a supplier you can rely on or not, if it is a stable relationship or not […].
>
> The CFO: I guessed that […] And who said that it is "high"? How was it calculated?
>
> The researcher: it is a qualitative indicator. It is based on the opinion of the CEO […].
>
> The CFO: it doesn't really make sense to me […] I would prefer to remove it from the report […] I don't want to create expectations […].

In both cases, during the design of the new IC measurements, the CEO and the CFO wanted, to some extent, to influence the sensemaking process of the other members of the focus group and, at the same, time, identify an indicator that was able to make sense for them, i.e. an indicator able to reflect their perceptions of the reality and justify their ideas. Thus, as seen in this case, sensemaking and sensegiving processes tend to be tightly connected.

With reference to the indicators which were already in use, they got included in the panel of IC measurements in order not to overload the employees with additional work. Here too, we report some of the discussions which ensued.

The general idea underlying this process of re-use of indicators can be represented by this sentence:

> We already have several indicators about personnel, customers, suppliers […] this system should try to put them together (the CEO).

In fact, from the analysis it emerged that there were some measurements for IC resources and activities (e.g. costs and time of training activities, marketing investments, etc.) but they were controlled and owned only by a specific area of the company (e.g. HR, marketing and sales, etc.) or considered to be "stand alone" measurements, i.e. not related to others (e.g. customer satisfaction). In other words, at the beginning of the project the CEO was expecting that by systematizing the different "single" indicators a different picture of the organization would emerge:

> We have always measured the hours of training but only for human resource management purposes […] It's the human resource manager that calculates and uses them. Nobody else is involved […] But it is interesting to relate them to the indicators about relational capital as it emerges that […] (The CFO).

What came to light here was that, as supposed by the CEO at the beginning of the project, by putting an existing indicator into an IC framework it was possible to enrich its meaning which, in this case, was not completely different from the previous one.

Among the already existing indicators at Mech, there was the "seniority index" (length of service). This index had previously been used to describe the status of the company employees. It had never been considered as something that hinted at the employees' competence level. an excerpt of the discussion is reported below:

> The CFO: How shall I interpret this indicator?
>
> The researcher: the idea of this proxy is that the higher the seniority index is, the higher the competences of the personnel are […].
>
> The CEO: ok […] but how high should it be? Is there a benchmark? And I don't think that high seniority always leads to high competences […] Some of my employees have done the same job, in the same way for years, and there is no way to make them change their way of working […].
>
> The researcher: that's right […] but you should read it together with the career tracking index to get its real meaning […].

In this case it emerges that the adoption of new measurements related to a new object (IC) requires intense sensemaking activity. Moreover, by combining the already existing indicator "seniority index" with a "new" one, the "career track" index, new insights were gained on the state of employee knowledge and competencies. The combination of the two indicators was used as a proxy of the depth (seniority index) and breadth (career tracking index) of employee competences. Here as well, existing indicators acquired new meanings as they got put into relation with other measurements.

Another indicator that grasped the CEO's attention was personnel turnover:

> CFO and researcher: as you can see, personnel turnover is very low. It seems that people are happy to work here […].

CEO: or it's because they do not have any chances of working somewhere else around here […].

CFO: that's not the reason, as you can see from our personnel satisfaction index […].

CEO: at the moment I don't think that having a low turnover is "so good" […] as we have a lower amount of sales I would like to reduce our personnel […].

Again in this case, by combining an existing indicator with a new one it was possible to obtain a more correct interpretation to the indicators.

5. Discussion

The collected evidences offer several insights about the sensemaking processes developed within the IC project. The first aspect that emerges regards the meaning of IC as a concept. Even if scholars and practitioners have proposed a plethora of definitions (Guthrie *et al.*, 2012), in practice it seems to still be an empty box. In other terms, each organization needs to make sense of this concept and identify the meaning that best fits the organization's purposes. A testimony to this is the fact that the starting point of the IC project was the question "What do you mean by IC?". This question was followed by a discussion which was intended to make sense of it. In Mech, the meaning of IC was defined through a process of "fragmented organizational sensemaking" (Maitlis, 2005), i.e. an animated process where all the participants raise issues, generate and shape accounts of the situations, and argue for potential solutions, while the "leaders" (in this case the CEO and the CFO) do not attempt to organize or control discussions. This approach allows a variety of perspectives to be produced (e.g. "Is IC related to sustainability?" or "Is it the same as human capital?", etc.) that, afterwards, need to be reconciled in order to progress from an individual sensemaking to an organizational one. In the case examined, this phase was particularly relevant as the efforts made to combine all the different ideas resulted in a definition that made sense to all the members of the group, i.e. they recognized IC as something relevant for everybody's activity.

A fragmented organizational sensemaking was also carried out with reference to the identification of the strategic resources. Also in this case, several ideas came out that needed to be reconciled afterwards and therefore, the process was quite time consuming. Nevertheless, the adopted approach allowed the focus group to achieve a result that made sense for all the members. Thus, the case study confirms that cause-and-effect approaches can be a useful tool for making sense of the reality, for simplifying the complexity of an organization in order to be able to manage it, and for focusing the management on the most relevant cause-and-effect relationships (Abernethy *et al.*, 2005).

A "restricted organizational sensemaking" (Maitlis, 2005) occurred during the development of the panel of indicators. In this case, the process was highly controlled but not very animated. In fact, the process was guided by the CFO and the CEO who engaged in high levels of sensemaking and sensegiving while the other members of the focus group tended to accept their interpretations, with relatively few attempts to provide alternative understandings. This type of sensemaking emerged at the beginning of the project with the idea of the CFO to propose a panel of indicators able to give a correct representation of the reality that is, essentially, the representation of the reality he perceives and believes is the "right" one which everybody should rely on. This was also evident in the discussions concerning single indicators such as the ones related to "IT integration" and "integration with suppliers" where the CFO and CEO designed the indicators according to their own visions and with the intent of

"not creating expectations" or avoiding the risk of "misinterpretation" of the indicators. The outcome of this approach was a single, dominant interpretation of the issue resulting from the lack of alternatives to the leaders' constructions. Although leaders may generally have a broader understanding of some issues than do individual stakeholders, their perspectives cannot include all the possible variety of perspectives that exist. In short, it emerges from the case that IC indicators are not "neutral" (Robson, 1992) but that they tend to embody the vision of a restricted group of people (in this case, the CEO and the CFO). This finding confirms the relevance of the "sponsor" and of the "project leader" in determining the success of an IC project as it is their vision that tends to be embodied in the IC numbers (Chiucchi and Dumay, 2015).

With reference to the definition of the IC value creation map, this was drawn by adopting a "guided organizational sensemaking" (Maitlis, 2005), i.e. a highly controlled and highly animated process. In fact, in Mech, this sensemaking process was guided by the leaders (CEO and CFO) who brought forward their vision but they also considered the perspectives offered by the other members of the group. In other words, the final map was not the one that made sense only for the CEO and the CFO but included, to some extent, also the ideas of the other members of the organization. Thus, this approach has resulted in a unitary and rich outcome, i.e. a result emerging from a systematic and controlled approach adopted by the leaders and able to incorporate the constructions of the many different parties engaged in the process.

The case study also highlights that maps can be a useful tool for making sense of the reality and for making sense of the implemented panel of indicators as they make it possible to "read" the indicators as a system and not as a collection of stand-alone numbers (Cuganesan and Dumay, 2009; Giuliani and Marasca, 2011). In other words, from the case study it emerges that a causal map can be a formal/structured tool for supporting the interpretation of the indicators. This became apparent on the several occasions where questions like "why do have an increase/decrease here?" were followed by answers like "it may be here that we have […]". In addition, the case also highlights that causal maps not only work as sensemaking devices but also as sensebreaking ones. As mentioned, the IC panel of indicators did not include only "new" ad hoc measurements but also existing ones that were already used by the firm's managers in order to monitor their daily activity (e.g. hours of training, turnover of the personnel, marketing costs, etc.). The problem was that these measurements were often seen as "stand alone", i.e. not related to other indicators, or used only by a specific manager (e.g. the human resources manager or the area manager). Once these measurements became IC indicators and were shown to be related to other measurements suggested by the map, they acquired a different meaning because they got observed from a different perspective.

In summary, the development of an IC project can be seen as a series of different types of sensemaking micro-processes and each of them can lead to a different outcome of the practice of measuring IC.

6. Conclusions

The purpose of this study was to investigate how organizations make sense of and give sense to IC measurements, i.e. to observe IC indicators through a sensemaking, sensegiving, and sensebreaking lens. In order to achieve this aim, a case study was presented and discussed.

The main findings are the following. First, the development of an IC project requires the development of an intense sensemaking and sensegiving activity as the managers of an organization need, first, to make sense of this new object (i.e. assign it a meaning)

and of the consequent new managerial practices and, second, to diffuse the sense of IC and of its measurements within the organization. Second, the development of an IC project can be seen as a series of different types of sensemaking micro-processes (guided, fragmented, restricted, etc.) and each of them can lead to a different outcome of the practice of measuring IC; thus, it seems possible to argue that the outcome of the project depends on the specific type of sensemaking/sensegiving adopted in each phase (e.g. lock-in, mobilization, etc.). Third, it emerges that IC can be a sensebreaking device, i.e. existing measurements introduced in an "IC box" can acquire different meanings. Finally this study underlines the importance of the role played by the "leaders" as concerns the IC sensemaking processes and the related outcomes.

From a theoretical perspective, this paper contributes to the extant literature regarding the production and use of IC measurements "in practice" as it highlights what happens when an IC measurement system is implemented. Moreover it contributes to the development of a "theory of indicators" (Catasús *et al.*, 2007; Catasús and Grojer, 2006) as it suggests aspects regarding how IC indicators are interpreted. Finally, the paper adds to the growing stream of analysis dedicated to the micro-processes of sensegiving and other sensemaking patterns, i.e. to the studies focused on how measurements are "shaped" "through the creative oral intertwining of accounting and other organizational knowledge" (Ahrens and Chapman, 2007; Almqvist *et al.*, 2011; Catasús *et al.*, 2009; Hall, 2010; Jönsson, 1998). More specifically, by using a sensemaking lens this paper sheds a different light on how managers understand and use IC measurements and offers some insights on how managers deal with "new" accounting objects and measurements. From a practical perspective, the paper suggests that in carrying out an IC project attention should be paid to the ability to design and implement a set of concepts, methods, and tools to enable sensemaking to take place in the organization and thus, to create a common understanding of the wholeness of the IC situation. It restates the need to accurately plan the development of an IC project, not only from a technical perspective, but also from an organizational one, i.e. to define which kind of sensemaking/sensegiving process (guided/fragmented/restricted) should be performed in order to achieve the expected results.

The limitations of this study are related to the adopted action research methodology (Middel *et al.*, 2006) and to the size of the investigated case study (Shen and Reuer, 2005).

Future research could follow dual avenues. First, there is a need for more in depth studies focused on how IC indicators are interpreted and on how managers make sense of or give sense to them. Second, there is the need for additional contributions that can enrich the extant "theory of indicators".

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Corresponding author
Marco Giuliani can be contacted at: m.giuliani@univpm.it