New business models: the Agents and Inter-Agents in a neuroscientific domain

Michela Balconi [1-2]- Maria Rosaria Natale [3]
Nadia Benabdallah [4] - Davide Crivelli [1-2]

[1] *Research Unit in Affective and Social Neuroscience, Catholic University of the Sacred Heart, Milan, Italy*

[2] *Department of Psychology, Catholic University of the Sacred Heart, Milan, Italy*

[3] *Your Business Partner Srl, Milan, Italy*

[4] *Group Network Engineering & Delivery, Vodafone Global, Milan, Italy*

DOI: http://dx.doi.org/10.7358/neur-2017-021-nata michela.balconi@unicatt.it

ABSTRACT

Agency has been classically defined as the ability to sense and judge ourselves as the generators of an action and of its effects. In interactions, the ability to sense and consciously recognize that we – me and you – are the ones that are generating an action and causing its effects has been instead defined inter-agency or joint-agency. The implications of having developed good agency-related skills and of being aware of such processes become crucially important when we think at complex situations that characterize the real-life professional domain. Based on the crucial role of relationship with other social agents, cooperation and team-work for business and management activities, novel business models might benefit from an increased awareness of the way we and our co-workers plan, behave, make decisions, and manage action outcomes.

Keywords: Agency; Inter-agency; Neuromanagement; Business models

1. The beginning agency and interagency in business models

It is a widely-shared belief and a commonly-reported notion when talking with managers that business is essentially constituted by and grounded on relations and interactions. For every project and activity there is a team of professionals that works both individually and together so to reach a common goal with the support of a head manager. And again, information exchange and sharing of ideas is peculiarly important if the managing approach is based on a collaborative leadership. In order to create and maintain functional interactions with someone else (a colleague or a supplier, for example), we have to detect the causal power that he/she can exert on the context we share, to consequently attribute him or her an agentive stance, and finally – but not less importantly – to understand his or her behaviour. All in all, as already suggested by Bratman (1992), cooperation involves and is generated by at least two intentional agents that recognize and treat each other as such, and that coordinate themselves with respect of each other's intentional agency and plans of action.

Neuroscience developed a recent approach aimed at applying and including the concept of agency in business domain. Indeed agency has been classically defined as the ability to sense (pre-reflectively) and judge (consciously) ourselves as the generators of an action and of its effects (Balconi, 2010a, 2010b; Gallagher, 2000; Synofzik, Vosgerau & Newen, 2008). As such, agency is a pervasive and fundamental aspect of our lives: it acts as the soil where intentional behaviour roots and it defines our ability to responsibly manage complex everyday situations – up to, in the professional domain, trying to make the best strategic decision or directing a work meeting (Balconi & Crivelli, 2009).

Further, as already underlined by the classical social cognitive theory by Bandura (1986), individuals do not act as isolated autonomous agents, they rather are *inter-active* agents exerting their causal power in a complex context and thus contributing to the definition of their own motivations and actions. During social interactions, agents act together – collaborating or competing – to reach a common goal that can be more or less consciously shared. In those situations the ability to sense and consciously recognize that *we* – me *and* you – are the ones that are generating an action and causing its effects has been defined inter-agency or joint-agency (Crivelli & Balconi, 2010). Agency and inter-agency can then be deemed as two of the main roots that sustain and support our being-in-the-world.

Focusing on the above-mentioned complex situations that characterize the real-life professional domain, the implications of having developed good agency-related skills and of being aware of such processes becomes particularly important. By increasing our awareness of how do we behave and how do we

read others behaviour (and maybe by empowering such abilities), we have then the possibility to foster the efficacy and quality of personal and professional relations. Again, a more profound understanding of our agentive role, of our behaviour responsibilities, and of our automatic affective reactions may help in reducing the level of stress in the work-team, even thanks to a proper management of inter-personal relations. Similarly, being able to depict a clearer picture of our primary active role in appraising situations, relations and contexts benefits the decision-making process and helps in choosing the best strategy even in open complex interactive situations.

2. How agency and awareness can be applied to new business models?

Following the article of Prof. Clayton M. Christensen published in 2013 at Harvard Business Review (Christensen, Wang & van Bever, 2013), we have in consultancy business three different business models: solution shop (and it's dead); value-added process business (and we have still a lot of great consultancy companies with this approach); facilitated network (Innovation and Design consulting firm IDEO is in this category). Now, as Your Business Partner (consultancy firm focused on Leadership and Innovation, based in Milan and London) we are creating another approach: *Action-Awareness-Adapt together*. Our business model is structured in an open way that allows us to act within our clients' companies and help them to become aware and "agent" of their own business model, which has to face a constant evolution in the market. We enable them to adapt continuously to this evolution/revolution. Our clients are willing to pay in order to learn effective ways to adapt themselves to the complexity they are living. Nowadays, innovation and sustainability have to go together.

As suggested by Maria Rosaria Natale (Senior Consultant, Founder and Owner of YBP), what we see is that the consultancy business is suffering because there is no innovation. Everyone talks about User Experience, which should be based on the real experience of the client, but in reality the business models are always the same and they are not capable of meeting the true experiences and demands of the businesses and industries which are now set in an ever-increasingly complex reality.

We work with several industries: automotive, healthcare, telecommunication, banking. In all of these industries, the managers of the top firms ask us to help them work together. They want to learn how they can become conscious masters of their success. But the first step is actually giving them awareness of their own business model. And then letting them discover

the value of individual awareness and of agency in order to work together in open systems, rather than closed and protective ones.

The cost of society: extreme complexity, unintelligible. It requires sensible, aware, adult, genuine and honest people. On the contrary today, we are all very fragile and hardly aware. Therefore, the most important job is to develop a way to teach self-awareness as a company and as individuals. The theme of individual awareness is incredibly disruptive: especially when it comes to CEOs and Top Management. But also when dealing with their business model in the competitive field, which is constantly evolving. Let's just think about NOKIA and Vodafone. These companies have business models that are completely different from the ones they implemented when they started out. To be sustainable, business models have to quickly adapt to the continuously changed scenario: this is only possible if there are managers and leaders able to promptly understand, together with their teams, how to re-design their processes.

Here is an example: YBP is working with a group of 8 hospitals of excellence and with 4 Harvard business cases about them. The CEO asked us to find the best way to help its leadership team (of 40 people) become innovative in such a way that would give them the ability to innovate processes and business models. This is a life cycle: helping people to be innovative so that they can re-design their own processes and change their business model accordingly. This is the only way to bring about big change in a sustainable way.

And to become innovative, people have to start actively observing their reality. For this reason, people in the hospitals, managers, doctors, nurses, spent time to observe and taking notes.

After this observation phase, together with Al Gregersen, a Professor of Innovation at MIT and a neuroscientist, we identified the set of skills they needed to innovate and the right exercises to stimulate and develop them. We also identified the four key processes they needed to innovate in their hospitals, which are:

1. Clinical processes
2. Operations
3. Quality
4. And people management

We worked with them for a year to put these skills into practice and to innovate their own processes.

We obtained the following results:

1. The re-design of their processes gave the hospitals the ability to manage an increased number of patients at the one time.
2. Less waiting time means improving patients' lives.

Thanks to the results, we are now applying the same methodology to 3 pathologies (Stroke, Prostat Cancer, Infections) involving again managers, doctors and nurses, to re-design the processes.

3. Why neuroscience for innovation?

As far as we are aware, all these fields are at the beginning of their true disruptive potential. In particular, however, the biotech field is a crucial dimension that is currently re-designing itself as far as treatment and healthcare are concerned. It will thus have an important impact on governments too. Today healthcare is one of the greatest challenges for the Western world.

When there is technology that leads to extreme personalisation, we are still not able, as individuals, to fully grasp the consequences and implications of it, as well as its impact on the systems that have so far carried our economies.

In this way, neuroscience may help us to discover the implicit sense of being an agent within a complex social context (also) made of other inter-agents (i.e. sense of agency and interagency) by using specific tools (Crivelli & Balconi, 2015). While the most recent developments of integrated neuroscientific-psychological-management approach to analyse business, human resources and strategy models are at the beginning of their lives. While such complex approach is continuously evolving to adapt to different concrete professional challenges and situations, the peculiar point of view of social-cognitive neurosciences and neuropsychology already seemed to offer a valuable help for both methodological-theoretical and technical reasons. Firstly, the neuroscientific and neuropsychological disciplines do include at their core a primary interest for human mind and its functions, and their application strongly rely on the integration of multiple levels of analyses – from overt behaviour and subjective experiences to covert central and peripheral physiological processes that accompany and support them – in agreement with the idea that such a multi-level analysis might lead to a more accurate description of complex phenomena such as human cognitive skills or relational abilities. Secondly, the long and well-established research tradition of neurosciences and neuropsychology led to devising and testing various investigation tools that proved to be able to open a window and to let researchers look at how psychological processes guiding – for example – our reasoning, decision-making and relational behaviour do develop.

Though the bases of human sense of agency and related social skills have been studied even with other tools such as Transcranial Magnetic Stimulation (a non-invasive brain stimulation technique able to stimulate the activity of neural

structures), electrophysiological and optical imaging investigation techniques can be plausibly considered, among neuroscientific tools, the more apt to be applied even on the field to help exploring how monitoring and understanding of our and others' behaviour actually develop in a specific context.

Electroencephalography – EEG – it being a completely non-invasive and quite usable technique, indeed allows for exploring the fine-grained modulation of neural activity that mirrors social information-processing and then builds up our ability to detect other agents, attribute intentions to observed behaviours, understand others' emotions and thoughts, monitor our and others' behaviour, and co-regulate interactions (Balconi, Brambilla & Falbo, 2009). For example, EEG has been recently used to explore early pre-reflective mechanisms that help us in detecting potential intentional agents in the environment, thus underlining the importance of first perceptual processes in understanding the behaviour of our consimilars (Crivelli, 2016; Crivelli & Balconi, 2015).

In addition, optical imaging methods might help in making the picture further clearer. In particular, functional Near Infrared Spectroscopy – fNIRS – is a recent non-invasive technique that allow for tracking cortical hemodynamic responses by using completely harmless near-infrared light pulses (Balconi & Molteni, 2016; Quaresima & Ferrari, 2016). It being compatible with simultaneous EEG recording, it can be used to enrich and complement electroencephalographic data. Further, recent fNIRS recording systems are also portable and highly usable, and then be used even in ecological settings to explore real-life situations (Balconi & Vanutelli, 2016b). And again, individual abilities to control the level of stress or to be aware and regulate affective reactions (both crucial to preserve functional relations) can, for example, be assessed by measuring autonomic indices (such as heart rate, skin conductance, or muscle tension) at rest and in peculiar activating situations (Balconi, Grippa & Vanutelli, 2015).

Finally, above mentioned neuroscientific techniques and tools can be integrated in *ad-hoc* multi-method investigation settings. By using multi-method settings it is actually possible to simultaneously record and track *in real time* the complex modulation of central and peripheral physiological activities linked to ongoing activities. Such pieces of information may then be integrated with data on subjective experience or, for example, performances to get quite complete *psychophysiological* pictures of what is happening to the involved person.

It is finally worth noting that things can be made even more complex if we are more interested in interactions and joined actions. Recently, a novel investigation approach was born, aiming at the characterization of dyadic interactions and of inter-individual processes supporting them: the *hyperscanning* approach. The term hyperscanning define studies where central and/or peripheral biosignals (such as EEG, fNIRS, heart rate, and skin

conductance) are simultaneously collected from two or more people who are interacting or are involved in the same task, and then analysed together to explore their synchronization and co-modulation (e.g. Balconi & Vanutelli, 2016a, 2016b). While such approach is still taking its first steps in applied neuroscientific research, its potential is, for sure, noteworthy for neuromanagement studies and applications.

4. One experience for disruptive business models: the words of Nadia Benabdallah and the "human dimension"

Let the words go on, a personal experience is here reported to have a view of the "agency" and "inter-agency in action". "A relevant topic in business today I work for a multinational that was built upon the acquisition of multiple companies across the world with the ambition of driving value from the true integration of the properties demonstrating that together they are worth more than each and every single one summed up. My mission in this environment to actually truly implement this concept by integrating the true hearth of the business together: Engineering! Responsible for planning, designing, engineering, testing, and developing efficient and effective Network and Service solutions. This integration is key to actually driving one univocal single direction towards a harmonized Vodafone Technology strategy delivering faster time to market, architecture harmonization, vendor landscape simplification, "design once deploy many" and finally true best practices application!" (Nadia Benabdallah, Vodafone).

I would like to bring the example of my organization as it has been a journey that has changes the lives of 2000 people along with the operating model of 13 countries across Europe When I have launched this journey I have to admit that I was thinking first and foremost about how I could make these markets: more innovative through the implementation of new innovative technology; more competitive bring and implementing always the best practices in Europe; more admired through best quality of service to the end customer; more efficient by driving scale, standardization, and simplification through the "design once deliver many" paradigm; more effective with a faster time to Market putting together the best engineering minds in Europe and never re-inventing the wheel but rather building upon successes.

Instead what I have found following my road shows across Europe is that all the questions I have received had one common thread and that is "the human impact of such an organization and how we were planning to manage it"?

In fact once can never forget the Human dimension of such an organization:

- How do I interact with my manager sitting thousands of miles away? How will he know that I am doing a great job? That I am leaving late everyday?
- How do I know that my team is working well? How do I make them collaborate together? What is the best way to communicate with them remotely
- How do I know if the team is happy and engaged?
- Can we take into account the time difference when we organize meetings?

A true eye opener: the success of such an organization had to work in parallel on 3 different tracks:

1. Driving Best Technology
2. Driving value and demonstrating that the integration is worth more than the sum of the part
3. People integration and their need to learn to manage remote team, to drive remote collaboration, multinational remote communication (communication style and communication means), to relate with a remote manager. All profoundly impacting the team and the market while being a fundamental pre-requite to delivering the above two objectives

And we obtained the following results:

1. Very engaged team able to have access to an international professional carrier without relocating, learning to work through a brand new Operating model never tried in the company, paving the with a transformational experience that all multi-nationals will go through in the future.
2. Very strong reputation worldwide with daily request of support with expertise, experience, and Operating model replication support.
3. Receiving the requests and compliments of all markets for the impact that the organization has had on the end customer!
4. Markets/teams seeking integration even though out of scope.
5. And thanks to the work performed together with YBP: most importantly the self -discovery of the actual impact that each individual has on the performance and Future of Europe!

The great difficulty when you go through an innovative first-time transformation is really about re-dimensioning and positioning boundaries, creating a sense of value rather than void, avoiding the fair of loss of control or power, and creating a strong identity in order to actually accelerate adoption of the new status quo and operating model".

5. To conclude: agency, human experience, "disruptive approach": what in common?

The environment where business activities grow and develop is dynamic and continuously evolving. With such premise, managers, teams, and consultants that work *in* and *with* such context have to be prone to change, to be able to promptly adapt to novel situations, and to be quick in finding efficient answers to problems. Since relationships with other social agents (them being people or complex entities such as companies), team-work, cooperation, and competition are at the core of business and management activities, and since we do enter such relational dynamics with our selves, our bodies, our beliefs, and our emotions, an increased awareness of one's own and others' perspective, of the way us and others plan and read behaviours, of whether and how we sense our agentive role in interaction, and of how we recognize and manage automatic dysfunctional affective reactions began to be deemed as a key factor (tough, according to classical engineering approaches to business and management, also a disrupting one) to be fostered and considered.

The link between agency, inter-agency, human experience and novel approaches to business and management does actually delve its roots into a common strong interest in the human factor and in the potential of self-awareness, thus overcoming traditional simplistic approaches to explain and intervene on business dynamics. By increasing the attention on the way we and our co-workers plan, behave, make decisions, and manage action outcomes, it is possible to increase, for example, team engagement and to make project management more efficient. While that might rather easily be experienced in common team work and management, one of the most difficult future challenges will likely be to test the impact and significance of such novel approach at higher complexity levels, where companies and other complex social agents come into play and interact to define general practices and lines of conduct.

REFERENCES

Balconi, M. (2010a). *Neuropsychology of the Sense of Agency*. New York: Nova Science.

Balconi, M. (Ed.). (2010b). *Neuropsychology of the Sense of Agency. From Consciousness to Action*. New York: Springer-Verlag.

Balconi, M., Brambilla, E., & Falbo, L. (2009). Appetitive vs. defensive responses to emotional cues. Autonomic measures and brain oscillation modulation. *Brain Research*, *1296*, 72-84.

Balconi, M., & Crivelli, D. (2009). Spatial and temporal cognition for the sense of agency: neuropsychological evidences. *Cognitive Processing, 10*(S2), 182-184.

Balconi, M., Grippa, E., & Vanutelli, M.E. (2015). What hemodynamic (fNIRS), electrophysiological (EEG) and autonomic integrated measures can tell us about emotional processing. *Brain and Cognition, 95*, 67-76.

Balconi, M., & Molteni, E. (2016). Past and future of near-infrared spectroscopy in studies of emotion and social neuroscience. *Journal of Cognitive Psychology, 28*(2), 129-146.

Balconi, M., & Vanutelli, M.E. (2016a). Competition in the brain. The contribution of EEG and fNIRS modulation and personality effects in social ranking. *Frontiers in Psychology, 7*, 1587.

Balconi, M., & Vanutelli, M.E. (2016b). Interbrains cooperation: hyperscanning and self-perception in joint actions. *Journal of Clinical and Experimental Neuropsychology*. Advance online publication.

Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory*. New Jersey: Prentice-Hall.

Bratman, M.E. (1992). Shared cooperative activity. *Philosophical Review, 101*(2), 327–341.

Christensen, C.M., Wang, D., & van Bever, D. (2013). Consulting on the Cusp of Disruption. *Harvard Business Review.* Retrieved from https://hbr.org/2013/10/consulting-on-the-cusp-of-disruption

Crivelli, D. (2016). Electrophysiological correlates of social information processing for detecting agents in social interaction scenes: P200 and N250 components. *Neuropsychological Trends, 19*, 45-69.

Crivelli, D., & Balconi, M. (2010). Agency and inter-agency, action and joint action: theoretical and neuropsychological evidences. In Balconi M. (Ed.), *Neuropsychology of the Sense of Agency. From Consciousness to Action* (pp.107-122). New York: Springer-Verlag.

Crivelli, D., & Balconi, M. (2015). The "social" and "interpersonal" body in spatial cognition. The role of agency and interagency. *Cognitive Processing, 16*(S1), 193-196.

Gallagher, S. (2000). Philosophical conceptions of the self: implications for cognitive science. *Trends in Cognitive Sciences, 4*(1), 14-21.

Quaresima, V., & Ferrari, M. (2016). Functional Near-Infrared Spectroscopy (fNIRS) for assessing cerebral cortex function during human behavior in natural/social situations: a concise review. *Organizational Research Methods*. Advance online publication.

Synofzik, M., Vosgerau, G., & Newen, A. (2008). Beyond the comparator model: a multifactorial two-step account of agency. *Consciousness and Cognition, 17*, 219-239.