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Crises and digital changeover as a source of disruption for business: trends and perspectives in Top Management

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Summary: 1. Introduction - 2. Crises, strategic changes and new business models - 3. The new meaning of performance - 4. A cultural and a technological shift? - 5. Change Management - 6. Trends and perspectives in Information Systems: the emerging role of CIO - 7. Final considerations and some implications.

Abstract

Economic and financial collapses, like 2008 Recession or current COVID-19 pandemic crisis, along with the ongoing digital transformation, constitute a significant source of disruption for business, representing a technological and cultural shift, and leading both, strategic and operational change.
In the immediate post crisis, we have witnessed a spasmodic search for business solutions that appeared innovative in all sectors: new business models thus began to take hold. New models call new performance measurements: in the space of just few months of the recession start, indicators went from being centred on long term profitability to cash flow optimisation.
In this context, more than ever before, companies need to integrated Information Systems capable of quick performance measuring.
The CFO traditionally plays an increasing strategic role to create new business models. But even more prominent inside the C-Suite is the role of the CIO, today an Executive at the cutting edge of innovation and driver of business growth.

Key words: Crisis, Digital Revolution, Disruptions, Change Management, CIO, CFO

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1. Introduction

On a theoretical level, this paper follows two streams of business administration and management literature.

The first one relates to change management (Lampel et al., 2009; Nonaka & Takeuci, 2019; Rossignoli et al., 2015; Sanchez, 1997, 2004; Selleri, 2018; Wang & Wang, 2017), crises (Berry, 2019; Galbraith, 2014; Lalonde, 2004; Iacovone & Paternò, 2013; Weick & Sutcliffe, 2007) and, more generally, disruptions (Amit & Zott, 2012; Cascio & Montealegre, 2016; De Toni & Rullani, 2018; Johnson, 2018; Schwab, 2017), such as that relating to the 'digital transformation' still underway (Bharadwaj et al., 2013; Brynjolfsson & McAfee, 2014; Fitzgerald et al., 2013; Floridi, 2012; Iansiti & Lakhani, 2014; Nambisan et al., 2017; Rullani & Rullani, 2018, 2020; Scaratti, 2019; Vial, 2019).

The second is instead related to the C-Suite, Top Management place where the so-called 'C-Managers' sit (Carmeli et al., 2013; Guadalupe et al., 2013), and latently considers the skills they possess (Groysberg, 2014) such as leadership (Cortellazzo et al., 2019; D'Egidio & Moller, 1992), dynamic capabilities (Karimi & Walter, 2015), including strategic flexibility (Aaker & Mascarenhas, 1984; Genus, 1995; Sanchez, 1997), timeliness (Teece, 1992), strategic creative thinking (Teece, Pisano & Schuen, 1997) - particularly necessary in critical periods to support top-level decision-making processes - and resilience, useful for not succumbing to exogenous attacks (Castaldo & Gatti, 2019; Drath, 2016), for surviving storms (Chu & Smyrnios, 2018; Kuntz et al., 2016) and reinventing oneself after them (Morais-Storz et al., 2018; Quenum et al., 2019).

With reference to the C-Suite, in recent years, some roles have been considered less than others (Dossi, 2017; Smith, 2007) for various reasons, both of a historical nature and strategic-operational origin, for example linked to the creation of value (Donna, 2018; Dossi & Pettinato, 2013; Golinelli et al., 2011).

The objective of this conceptual article is to fill what appears to us as a gap highlighting the figure of the Chief Information Officer (CIO), often neglected as Information Systems (IT) have been long considered a mere cost for the company or, at best, seen from the perspective of the resolution *ex post* of technical or operational problems, and therefore passively (Carter et al., 2011; Metallo, 2011).

In particular, the question we ask ourselves - given the digital transition of society, which the pandemic period has enhanced, making it extremely evident for the world of business and work - is whether the CIO is becoming a key manager, as Paul et al. (2018) have suggested, and will be even more so, in the near future.

To articulate our discussion, in the next paragraph we will make an overview on crises, such as that of 2008, on strategic changes and new business models. By connecting directly to the latter, in paragraph 3 we will briefly talk about performance management, and then go on to deal with the broad phenomenon of change and change management, in paragraphs 4 and 5 respectively. In paragraph 6, the emerging figure of the CIO is then outlined: we will talk about this managerial role and we will outline a trend and some perspectives, not without managerial implications, which will be dealt with in the final paragraph.

2. Crises, strategic changes and new business models

A careful examination shows that the current business situation is the result of a series of disruptions. The first of these, in the fall of 2008, was a disruption in sources of financing: the markets, and later the banks, increased the cost of credit, further precipitating the crises we have been experiencing until few years ago.

Business activities decreased, employment stagnated, and people morale was at its lowest: never before a stock market crisis turned into an economic crisis with such speed (Galbraith, 2014). The media tone changed - it was often too alarmist or even too optimistic at times - thus reflecting the moods of the people and entrepreneurs 'expectations. (Berry, 2019).

Underneath the breath-taking slowdown of the economy, a more profound movement was becoming apparent: a shift that challenged the current business models and economic thinking (Johnson, 2018).

This financial disruption was followed by strategic disruption, since in this same period most of company directors believed they would be forced to revise their business model in the immediate future (Amitt & Zott, 2012). Along with strategic disruption came operational disruption. Faced with a severe downturn in business, companies had to rapidly adapt under pressure by reducing their relationships with customers, suppliers and competitors (Weick & Sutcliffe, 2007).

A likely situation is happening now. The unpredictable COVID-19 pandemic, with its rapid spread from China to Europe and the world as a whole, caused a vigorous slowdown in consumption (with some exceptions such as for consumer goods linked to food or health) and production in some industrial sectors more than others (Castaldo et al., 2020). Furthermore, Experts[1] agree in predicting this will result in a corresponding slowdown of the Gross Domestic Product (GDP) and the time to re-emerge will be considerably extended.

In particular, in Italy - among the Countries highly affected by the Covid-19 crisis - a decline in economic activity of exceptional intensity, never recorded in the history of the Republic, is set for 2020: Italian GDP is estimated to drop by around 9 percentage points in the 2020 (Castaldo, 2020a).

Clearly, utmost caution is needed in the evaluation of estimations, which have suffered by extremely uncertainty in the recent weeks. However, what seems assured is that the decline in production, together with the decrease in profits, is generating a contraction in consumption and a crisis, which is translating into an unprecedented demand for social safety valves.

In the first few months of a crisis, there is one question on everyone's lips: How should we react? (Kovoor-Misra et al., 2000; Lalonde, 2004).

In the past many companies under such conditions were tempted to adopt the cost killing approach (Genus, 1995; Sanchez, 2004). Caution is in order, however: although cost management is more crucial than ever, blindly slashing costs can cripple the

[1] Source: World Economic Outlook, FMI.

company later when business picks up again or cause it irreparable damage (Lampel, Shamsie & Shapira, 2009).

In other words, companies must reef the sails to survive the storm (Chu & Smyrnios, 2018), but must also prepare the ship to move forward again when calmer seas return (Kuntz et al., 2016; Quenum, et al., 2019; Weick & Sutcliffe, 2007).

They should make - as Aaker & Mascarenhas (1984), Copeland & Wiener (1990), Genus (1995) and Sanchez (1997) already theorized - the necessary savings in the short term, but guard against sacrificing investments that are essential in the medium term.

Preparing for the post-crisis is, without a doubt, the greatest challenge companies have to face in the current crisis situation, as it happened in the years around 2010.

In all areas mentioned before, in fact, the crisis has accelerated the rate of change in an exceptional manner: in the last years we have seen the numbers of mergers and reorganisations increase steadily, resulting in a thorough overhaul of business models (Brynjolfsson & McAfee, 2014; Chang et al., 2010; Johnson, 2018).

Moreover, in the immediate post crisis - starting from 2013 - we have witnessed a spasmodic search for business solution that appear innovative in all sectors: new business models thus began to take hold (Amit & Zott, 2012).

3. The new meaning of performance

New business models call for new indicators (Teece, 2010).

Performance measurement has changed radically too. In the space of just few months of the great recession start, indicators went from being centred on long-term profitability to cash flow optimisation, productivity and human resources (Amitt & Zott, 2012).

In this context, more than ever before, companies needed integrated Information Systems that were capable of quickly measuring performance and helping those at the helm steer a safe course through the storm (Melville et al., 2004).

One of the biggest challenges was understanding the interdependencies between the crisis, strategic changes and new business models, and how they could affect business performance.

Traditionally, CFOs play an important role in this: they know how much leeway the company has, and they have in-depth knowledge of the processes and methods for measuring its effectiveness (Dossi, 2017).

Some Authors believe that because of this CFO, who tends to be closer to operations, is the most strategically placed executive in the company to create a new business model and to monitor its progress with appropriate performance indicators (Dossi & Pettinato, 2013; Howell, 2006).

Companies that are unable to choose a transformation strategy are notoriously unable to reach a level of excellence in any domain: their efforts are dispersed, and their position is threatened from all sides by competitors or newcomers with a clear differentiation plan (Teece, 2010; Quenum, et al., 2019).

On the other hand, creating or choosing a model is difficult because it means concentrating all efforts on what is essential (Johnson, 2018).

Moreover, choosing a differentiating strategy leads to business models that are very different in terms of organisation, product processes, customer relationship and, of course, different value propositions require different business processes (Donna, 2018). Take operational excellence (or differentiation through cost), for example: its distribution policy requires a single procurement department and standardised retail outlets that are usually set on self-service criteria, where customer intimacy scenario require a more flexible organisation in which the decision power lies much closer to the end client and where orders are taken by salespeople who have little room to negotiate.

Anyway, once a business model is chosen, it must be adhered to in order to reach or maintain a competitive vantage and to be profitable; this is also the challenge of the value discipline (Barile & Gatti, 2011; Donna, 2007, 2018).

4. A cultural and technological shift?

A sign of just how profound the changes underway are is the fact that many companies are also experiencing a cultural shift (Scaratti, 2019), in their management practices, first of all (Lampell et al., 2009).

Companies that survive the crisis, which prove resiliency are often the ones that have understood the importance to think as a team rather than in terms of hierarchy (Castaldo, 2018).

The other cultural shift has to do with technology and the new uses for it (Rullani & Rullani, 2018; Vial 2019). The advent of internet and mobile technologies has already drastically changed the way company (Brynjolfsson & McAfee, 2014; Cascio & Montealegre, 2016) and the whole society function (Volpe, 2015, p.49).

The impact of Big Data on management is beginning to be felt (Iansiti & Lakhani, 2014) while the development of artificial intelligence will have an increasingly significant impact on all areas of projecting and decision making (Castaldo, 2020c).

Of all the shifts, these are undoubtedly the most profound. They are unavoidable and affect all areas of business (Nambisan et al., 2017).

Just as in any period of major transformation, companies that want to remain competitive are therefore faced with a vital choice: to adapt as best they can while being subjected to technological and cultural shift or to fully integrate both in order to invent a new model - their own model - and come out of the crisis on top (Johnson, 2018; Quenum et al., 2019; Teece, 2010).

The low-cost industry (hard discounts) and luxury items tend to survive times of crisis, as happened in Europe in 2008; the same applies to comfort products (such as chocolate, gossip magazines, lotteries and bets), but also electronic distribution (such as smartphones and digital services) or organically grown products, that were unaffected by 2008 economic crisis. Likewise, in the current pandemic crisis the demand for some medical devices, like face mask, disinfected products such as sanitizing gels or, more generically, healthcare goods, seems to be making the drugstores business and related industries proliferate.

In a similar way, a very good example of differentiation is represented by some enlightened Italian restaurateurs, closed to the public during the lockdown period, reinvented their business by becoming delicatessens selling ready-to-eat and deliverable food to their historic or newly acquired clientele.

This confirms what we already knew: crises are first and foremost trend accelerators and in every tense situation, differentiation pays off (Lalonde, 2004; Lampel, 2009; Rossignoli et al., 2015).

The crises have changed, one might say, "the context". Generally, when the environment changes - argued Eisenhardt (1989) - it is misguided, not to say risky, not to foresee the capability to evolve with it (Karimi & Walter, 2015)

According to some eminent Authors, such as Aaker and Mascarenhas (1984), Genus (1995), Sanchez (1997), Teece, Pisano and Schuen (1997), having dynamic capabilities like timeliness and strategic flexibility is fundamental to move successfully in instable markets and turbulent competitive arenas (Castaldo, 2018).

In terms of already starting to lay the foundations for the post-crisis world, change is an obligation - and an excellent opportunity - to prepare for the economic recover (Johnson, 2018; Teece, 2010).

Companies have to adapt their organisation and way of working even more quickly and fundamentally than before (Iacovone & Paternò, 2013).

In other words, it rapidly becomes clear to organisations that they need to work differently in order to maintain a significant competitive advantage: the search for innovative methods to do so then becomes a real priority for management (Porter, 1985; Sanchez, 2004; Teece, 1992, 2010).

5. Change Management

Change management technologies are designed to provide a framework for and to guide this transformation, by setting the pace, creating meaning and making the process comprehensible for everyone (Rossignoli et al., 2015).

Of course, change management has to be adapted to the specific issues facing every client (Karimi & Walter, 2015) but the objective remains the same: rapidly adjust operating models, action plans or behaviour depending on the context (Porter, 1991).

Well executed change is an indicator of future success (Selleri, 2018).

So, how best to set a change process in motion? What are the critical success factors for transforming processes and organisations? How to obtain buy-in and secure commitment from teams?

In these troubled times, to be efficient, companies must have the capability to rapidly simulate and demonstrate new ways of working, such as smart working, to measure the extent to which employees accept the new model and to re-think the way in which teams are mobilised (Wang & Wang, 2017).

To measure the extent to which employees accept changes, in particular, internal surveys, indicators linked to change methods and benchmarking, comparing organisations and results in real time, are used normally.

The crisis has reinforced practices such as knowledge sharing and evaluation. Companies increasingly seek to understand the experiences of others, both in the same sector or at national or European level. They are thus increasingly evolving into "learning enterprises", to use the famous Senge's words (Senge, 1990) or "wise companies" in the meaning used by Nonaka and Takeuchi (2019).

Currently the hottest topics are in fact employee satisfaction and commitment, executive coaching, diversity and collaborative processes.

When companies are forced to do more with less resources, the only way forward is to put into place different and innovative tools that encourage collaboration between teams. These techniques favour the exchange of best practice and knowledge sharing by transforming the working environment, which becomes more transparent and facilitates agility (Loebbecke et al., 2016).

They push back the borders of what is possible in an amazing way to enable the transformation of the business and its organisation (Lampel et al., 2009).

To put into perspective the change specific tools can be used, such us business games. On the basis of simulation and role-playing techniques, these exercises make it possible to discover, visualise and integrate new operating models by way of transformation scenarios. This enables the creation of "change laboratories", where things can be put into perspective in a rapid and measurable way - which is increasingly a necessity today, when action plans have to be developed, tested and launched in a very short time span.

This time pressure, increased in the wake of crisis, requires results concrete, demonstrable to all, both internally and externally, more and more quickly (Teece, 2010).

Nonaka and Takeuchi (2019) have demonstrated how continuous innovation results from companies ceaselessly and repeatedly creating new knowledge, disseminating knowledge throughout the organization, and converting that knowledge to action. In the opinion of these eminent authors, the 'Wise Company' presents therefore a new model of knowledge-creation and practice for the twenty-first century (Nonaka and Takeuchi, 2019).

6. Trends and perspectives in Information Systems: the emerging CIO role

Adversely affected by the financial and economic crisis, businesses have to face several considerable challenges. The financial and economic crises and the ongoing digital revolution have been, in fact, a source of disruption for business (Fitzgerald et al., 2013; Selleri, 2018): interference in strategies and operational model as well as cultural and technological disruption.

The acceleration of the rate of change required to cope with economic slowdown and extreme competition, following the *iter* described in the literature by D'Aveni,

(1994) and Thomas (1996), is forcing businesses to adapt their offering and prices, increase economies of scale and reduce costs, as well as strengthen customer relationships.

Surviving the storm means seeking out value creation (Barile & Gatti, 2011; Donna & Borsic, 2000; Golinelli et al., 2011), and at same time are dependent on companies' effort to innovate (Gatti, 2007; Rossignoli et al., 2015).

The rise of internet and mobile technologies has already dramatically changed the way businesses operate (Cascio & Montealegre, 2016).

Further technological changes are on the way: the impact of social networks on the way business operate and how teams are managed; images supplanting text for many purposes (Iansiti & Lakhani, 2014); the impact of artificial intelligence on activities such as forecasting, risk prevention and business intelligence (Castaldo, 2020b).

With regard to technological level, a decisive transformation has impacted in recent years Information Systems of companies. For a long time, Information Systems (IS) departments were considered by top management as cost centres whose added value was difficult to measure (Hagel & Brown, 2001; Melville et al., 2004).

In addition, failures and difficulties encountered with numerous Information Technology (IT) projects served only to maintain this *status quo*, or even increase management's wariness of information technology (Chorafas, 2011).

The function of Information and Communication departments was considered to be to support cost reduction in the business units (Smith, 2007, Metallo, 2011).

After a period of conflict, the relationship between Chief Information Officer (CIOs) and the business units improved: CIOs built closer links with businesses units by gradually involving themselves in their development and in corporate strategy (Carter et al., 2011; Paul et al., 2018).

CIOs developed approaches which ensured that Information Systems was better aligned with the business units. They communicated with top management, the business units and users, providing information on their services, performance and related costs (Guadalupe et al., 2013).

The most forward-looking have managed to implement service agreements, justifying their investments and demonstrating value creation. Information Systems thus became a fully-fledged contributor and a key factor of operational excellence for both management and the business units (Paul et al., 2018).

Until lately regarded as cost centre managers, CIOs today must consider themselves to be at the cutting edge of innovation and drivers of business growth (Carter et al., 2011).

Information Systems could thus be perceived – especially in the crisis and disruption situations – both as a means to strengthen the company's value proposal and reinforce its position in its market (Bharadway et al., 2013).

In the current dynamic situation CIOs need to seize any opportunity offered by new technologies to broaden and re-examine their role and positioning within the company (Weill & Woerner, 2016).

These Top Executives, in other terms, have today a unique and unmissable opportunity to position IT as an activity capable of generating value for operational management (Amit & Zott, 2012). This means, on the one hand, continually developing the added value to the businesses of existing applications and, on the other hand, using technology to identify and implement growth initiatives (De Ritis, 2020).

For this change to be successful, but also to weather the storm in times of crisis, IS managers however need to develop and implement new models based on new technologies (Cortellazzo et al., 2019).

This management Information Systems needs specially to transform its operational model and further develop its information systems to increase their flexibility and scalability and deliver its services at the lowest possible cost (Melville et al., 2004; Metallo, 2011).

The objective is to optimise or even reduce operating budgets, improve application profitability and increase resources allocated to innovation and businesses development opportunities (Quenum et al., 2019).

In conclusion and ideally, in a given company, each and every member of staff every day must be able to access the internet, email, databases, and transactional applications, in accordance with the needs defined by this same company and at the lowest possible cost (Cascio & Montealegre, 2016).

Likewise, awareness is growing that the CIO has become responsible for all automated business processes and must therefore seek to continually improve their added value (Paul et al., 2018; Schwab, 2017).

The CIOs primary concern is, and will continue to be, however, that of being in charge of the information generated by the company (Cortellazzo et al., 2019) protecting its content in the safest and most resilient possible way, thus guaranteeing its confidentiality, integrity and availability (Castaldo, 2019).

7. Final considerations and some implications

The crisis is an unexpected and sometimes tragic event, which really changes things but in the drama of which the possibility of a mutation towards the better opens up, a *schöpferische Zerstörung*, to put it in Shumpeterian terms, that is a destruction that creates new exciting possibilities.

In other words, crises represent a sudden disruption from which opportunities, new business models and new lifeblood could emerge (De Toni & Rullani, 2018).

Moreover, crises could act as a trend accelerator and the current one, due to the historical contingency in which we are immersed, is giving a sustained movement to the so-called "digital transformation".

In the current and foreseeable digital transition, especially in some advanced Western countries, one managerial category seems to emerge more than the others – that of the CIO – rising to a role of increasing importance (Carter et al., 2011; Paul et al., 2018).

Some implications can be drawn from this, relating to two areas: the one more properly related to businesses and the more general one, related to society. As we will see, both have to do with the cultural dimension.

With reference to the first one, we can deduce that companies, which already had - before the pandemic crisis - a CIO among the managers operating in the C-Suite (typically large companies), should not have major problems or strong resistance to change, and to recognize him a greater role in the immediate future, in decision-making processes both at the Top and operations level.

For smaller companies, for those belonging to sectors with low technological content or to less digitally evolved countries, for start-ups and newcomers, however, there could be inertial difficulties, of a cultural nature, just to foresee the existence of this kind of manager, where he's not present. The main indication deriving from our study is instead precisely that of the importance, never before so evident, of creating this managerial category, or of strengthening it, if it already exists (King, 2011), entrusting it with a non-secondary part of management, recognizing its potential contribution to the generation of value, not only for the shareholder, but for all stakeholders (Weill & Woerner, 2016).

This is not something simple, especially in context such as the Italian one, scattered with many very small, small and medium-sized enterprises. And a change, of any kind, requires sometimes arduous cultural adaptations.

We are experiencing a very delicate period in our history and the transition to a post-pandemic economy and society will be more or less difficult, depending on how serious the failure of the real economy at the local, territorial level has been.

Keeping the contextual variability firm, the main social implication that we could draw from it is that relating to the training of young people, the future managers and leaders, in full awareness they will have to operate in unstable and uncertain contexts, as never before.

With particular reference to Italy, training can no longer afford the luxury of being released from the real needs of the industrial and working world, an increasingly digital world, as we have seen. Hence the recommendation for the academies and universities is for an up-to-date and enhanced training (of digital content), and for a targeted education, a real training to operate in conditions of turbulence, uncertainty and unpredictability, as the lesson of the pandemic has severely imparted.

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