
ORGANIZATIONAL STRATEGIC MANAGEMENT RESPONSES AND CONSEQUENCES DURING COVID-19 ERA

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ABSTRACT

One consequence of the COVID-19 pandemic is that companies based on conventional (linear) value creation logic and traditional management solutions, even agricultural enterprises, are forced to make such strategic decisions and apply such strategic planning techniques which have not characterised them so far.

My basic assumption is that the circumstances have been triggered and accelerated the linear–nonlinear transformation at companies. In this sense, during the value creation of linear organisations, special sets of functions emerge that are nonlinear in their nature. These include the development of adaptation skills, activities focusing on innovation, creativity management, rethinking of HRM, coordinating digital transformation, and all the skills which are needed to successfully respond to an increasingly unpredictable (complex) operating environment.

The aim of the paper is to take a snapshot of the current literature dealing with strategic management responses on the consequences of pandemic and – in the same time – categorize the main suggestions, conclusions of the selected papers and documents in line with the steps of the strategic management process. In addition, I want to point out the core essence of the nonlinear management approach reflecting on the content of the literature. Finally, I analyzed the managerial responses of the Hungarian Blue Chip companies in line with the pandemic. The literature suggests a really wide range of solutions to handle the current situation affecting almost all of the most relevant strategy-making areas. The results show that the linear–nonlinear transformation has started in Hungary as well, but in many cases it is still in its infancy.

Keywords: COVID-19, literature review, nonlinear approach, strategic management, complexity

INTRODUCTION

The processes of the surrounding nature show the typical signs of nonlinearity (complexity). These types of systems differ from human-preferred, predictable, controllable linear systems, which are mostly human-made, artificial systems. The nonlinear world – with its own rules and peculiarities – cannot be made linear/predictable to an unlimited extent, even if humanity thinks so (NAGY, 2015).

Moreover, it seems as if these phenomena are appearing more and more often: we sometimes have to face and adjust to events that are very unlikely to occur (MÉRŐ, 2018; TALEB, 2010). Others refer to these nonlinear conditions as a VUCA environment. VUCA is an acronym, first used in 1987 and based on the leadership theories of BENNIS AND NANUS (1985). VUCA means *Volatility, Uncertainty, Complexity* and *Ambiguity* (VUCA-WORLD.ORG).

We live and try to create value under such conditions in which unpredictability, nonlinearity, complexity become more and more relevant.

Such a creature can survive and continue to exist which is able to adapt intelligently to these turbulent conditions. The same is true for companies, especially in a pandemic period like the current one.

This turbulent/nonlinear environment affects – obviously – the organizations' strategic and leadership aspects as well, so traditional experiences, paradigms and the linear thinking should be reappraised.

This short description tries to capture the essence of such systems, but it does not give the whole picture. Those systems are considered complex and adaptive (or VUCA environment) which can be described with the following properties (BOISOT AND MCKELVEY, 2011; DINYA, 2008; KAISLER AND MADEY, 2009):

- large number of heterogeneous agents or elements arranged in structures,
- these agents interact locally and are connected with each other directly or even indirectly,
- there are basic/simple rules inducing, enforcing self-organization and system (nonlinear) dynamics (the system changes over time),
- non-linearity: slight changes in the initial conditions of the system status induce: (1) large, (2) small changes or (3) do not cause any change at macro level,
- feedback mechanisms in the system facilitate the adaptation,
- emergent features and patterns on macro level owing to the system dynamics,
- far-from-equilibrium state,
- interdependencies and optimal adaptation at the edge of chaos in response to environmental changes.

Translating the above mentioned characteristics to VUCA environment, the following statements can be made (BENNIS AND NANUS, 1985; GEORGE, 2017; VUCA-WORLD.ORG):

- Constantly evolving conditions and rapidly changing environment,
- The changes become more and more unpredictable,
- Events unfold in completely unexpected ways,
- It's becoming more difficult to anticipate events or predict how they will emerge,
- Forecasts and extrapolations based on retrospective analyses and past experiences are losing their relevance and are rarely applicable as a starting point for future predictions,
- These circumstances of course change the former risk assessment and risk management tools,
- Problems and their consequences are more compound and become harder to understand.

In order to manage the nonlinearity, complexity and the VUCA environment sufficiently, the only way for a proper response is if we increase our organization's nonlinearity and agility as well. Mixing the nonlinearity and organizational theory is not a newfangled idea. Such nonlinear companies can be better in responsiveness, organizational resilience, financial sustainability, they are more efficient and prosperous than a traditional/linear/bureaucratic one (NAGY, 2015 quotes: ALLEN, 1988; BURNS AND STALKER, 1961; BROWN AND EISENHARDT, 1997; MORGAN, 1997 in LEVY, 2000).

The changes in the external environment should be treated not as threats rather new possibilities for higher value creation. It is obvious that the leadership style should be also adjusted for exploitation of the benefits stemming from the complexity (BENNET AND BENNET, 2008; HAZY, 2008; SURIE AND HAZY, 2006).

The inherently nonlinear companies have the following characteristics:

- these companies mainly operating in knowledge-based, information economy especially in technology sector – producing nontraditional products and services;
- they non-traditional inputs intangible resources: e.g. special knowledge, creativity, information, network positions, special skills;

- the operation of the value creation processes can not be pre-designed, predicted, pre-simulated;
- innovative ideas, information, knowledge are generated or transferred by nonlinear systems;
- new, more efficient management and HR management functions are developed under the new paradigm;
- *New generation* companies using non-traditional resources usually have greater potential for growing and realize more added value.

There are several concepts and ideas however which try to handle the nonlinearity on an organizational level. Some remarkable example can be mentioned:

- VUCA leadership concept (GEORGE, 2017)
- Complexity Leadership Theory (UHL BIEN ET AL., 2007)
- Organizational agility (MCKINSEY & COMPANY, 2015)
- Cynefin framework (KURTZ AND SNOWDEN, 2003)
- Creativity management described in the Books *Collective Genius* (HILL ET AL., 2014) and *Creativity, Inc.* (CATMULL AND WALLACE, 2014)

DINYA (2008) also drew attention to the underlying (and necessary) paradigm shift. According to him, the difference can be seen in three areas (*see the following Tables: 1., 2. and 3.*).

Table 1: A brief comparison between traditional and nonlinear companies according to the cultural paradigm shift

Cultural Paradigm	
Traditional companies	Nonlinear companies
minimize risk!	we learn from failures
who is not with us – is against us!	who is not against us is with us!
great profit, faster growth	great profit, more innovation
you're worth as much as you sell	you're worth as much as you know (<i>e.g.</i> creativity or special skills)
the key to success is a professional management	the key to success: an excellent community

Source: based on DINYA (2008)

Table 2: A brief comparison between traditional and nonlinear companies according to the management paradigm shift

Management Paradigm	
Traditional companies	Nonlinear companies
the world of business: constant competition	the world of business: constant adaptation (to build up resilience and the ability to react intelligently)
the organization: an oiled machine	the company: self-organizing organism
the main managerial task is the control over the resources and human resources as well	the main managerial task is the service, to create an enabling working environment
leadership: managing the workforce	leadership: employee support
environmental change is a threat	environmental change is a great opportunity to create value

Source: based on DINYA (2008)

Table 3: A brief comparison between traditional and nonlinear companies according to the organizational paradigm shift

Organizational Paradigm	
Traditional companies	Nonlinear companies
regulated (linear) input-output relationships	nonlinear behavior
stable, balanced operation	high flexibility
centrally controlled	self-organizing system
emphasis on integrated internal processes	emphasis on intense environmental relationships
harmony among strategy – tactics – operational goals	balance between chaos and order

Source: based on DINYA (2008)

In this context, I was curious about the strategic management implications of the new situation induced by COVID-19.

MATERIALS AND METHODS

This article is basically a systematic literature review with additional primary research affecting practical aspects.

A review of the literature can be conducted on the basis of various aspects. This synthesis was made taking into account the phases of the strategic management process and puts the linear-nonlinear transformation in focus. My basic hypothesis is that the current pandemic period – with its unpredictability and nonlinear nature – accelerates and prioritizes nonlinear transformation in relation to traditional companies as well, which means in my interpretation that more and more solutions are used in the short term or during strategy-making.

I have defined three research areas in this article:

- (1) Literature coverage of the strategy management processes induced by the COVID-19. (snapshot of current professional and academic opinions on the strategic responses in the light of pandemic and nonlinear management).
- (2) Synthesis of the literature in the light of nonlinear management aspects of the pandemic.
- (3) The focus of the management responses of the Hungarian Blue Chip companies for the financial year 2020.

To examine these areas, I collected relevant articles and documents, supplemented with the Annual Reports of the most significant companies of the Budapest Stock Exchange. The shares of the selected 16 companies are components of the BUX basket.

I selected and analyzed a total of 30 articles and documents to get a better insight to the current opinion of the academic researchers and professionals. Literature embraces the most recent and relevant publications written and edited by scientists, experts and

professional consulting firms. Sources of these papers were the databases of Google, Google Scholar, Scopus, Web of Science and articles covered by GARCÍA-MADURGA ET AL. (2021).

Inclusion criteria were:

- research articles published (or in press) in scientific journals,
- documents published by global organizations and consulting companies,
- published during 2020-2021,
- written in English,
- focus areas: business management or social sciences,
- keywords or topics including at least one of the following expressions: COVID-19, business, strategy, management and leadership, digital transformation, change.

Exclusion criteria were:

- public sector organizations,
- conference transcriptions,
- books or book chapters.

In order to analyze the above mentioned three research areas, I chose organizational strategic management as an analytical framework because in this regard we can catch the long-term commitments of the given company and, at the same time, the implementation of the strategy requires short-term thinking as well.

MAROSÁN (2006) uses a sufficiently detailed framework. It has 3 main categories and 14 subcategories. I. Strategic analysis: 1. intentions and interests (vision, mission, values); 2. analysis of the external environment; 3. analysis of the internal situation. II. Decision on strategic actions: 4. elaboration of different versions (general goal settings, scenario planning); 5. comparison of alternatives/versions; 6. strategic decision (strategic objectives). III. Strategy implementation: 7. resource planning (including financial and efficiency aspects, capacity building, value chain planning); 8. shaping organizational structure (formal & informal); 9. building organizational culture; 10. implementation; 11. management and leadership; 12. control mechanism; 13. change management; 14. feedback and learning. Of course, the individual components are not necessarily separate from each other, as they are often built on each other and are organically connected. The application of this framework is also supported by the fact that it is much more detailed than the commonly used strategic analysis tools (*see e.g.* KORNELIUS ET AL. 2021).

To match and to categorize the literature, suggestions, thoughts and companies' reactions in line with the proper strategic management component, I use content analysis of the selected documents. To describe the nonlinear management transformation, I used DINYA'S (2008) categorization: cultural, management and organizational paradigms.

RESULTS

Results are presented in the order of the research areas.

(1) Literature coverage of the strategy management processes induced by the COVID-19

The following Table (*Table 4.*) contains all the steps of the strategic management process and the related publications. It could help us to answer the first research question. This points out the wide spectrum of the authors' interests and research focus.

Table 4: Steps of the strategic management process and the distribution of the analysed literatures according to their main focus

Steps of the strategic management process	Related publications
I. Strategic analysis	In general: X
1. intentions and interests (vision, mission, values)	AXSON (2020), HUY (2020), PwC (2020b)
2. analysis of the external environment	DI VAIO ET AL. (2020), HUY (2020), PwC (2020b), SCHALTEGGER (2020)
3. analysis of the internal situation	HUY (2020), PwC (2020b)
II. Decision on strategic actions	In general: X
4. elaboration of different versions (general goal settings, scenario planning)	AXSON (2020), DI VAIO ET AL. (2020), HUY (2020)
5. comparison of alternatives/versions	X
6. strategic decision (strategic objectives)	McKINSEY & COMPANY (2020)
III. Strategy implementation	In general: AXSON (2020), BATRA (2020), PUTRA ET AL. (2020), PwC (2020a)
7. resource planning (including financial and efficiency aspects, capacity building, value chain planning, business models, HR aspects)	ALMEIDA ET AL. (2020), AXSON (2020), BATRA (2020), BOND III ET AL. (2020), BREIER ET AL. (2021), CASALINO ET AL. (2020), CRICK AND CRICK (2020), D'ALIZZA AND DARRELL (2021), DELOITTE (2020), DI VAIO ET AL. (2020), HAMILTON (2020), IBM (2020), IFC (2021), KRAMMER (2021), McKINSEY & COMPANY (2020), PATUELLI ET AL. (2021), RENJEN (2020), RITTER AND PEDERSEN (2020), RAPACCINI ET AL. (2020), SCHALTEGGER (2020), SEETHARAMAN (2020)
8. shaping organizational structure (formal & informal)(including information flow structures, stakeholders, cooperation)	CRICK AND CRICK (2020), DELOITTE (2020), DI VAIO ET AL. (2020), GARCÍA-MADURGA ET AL. (2021), IBM (2020), IFC (2021), McKINSEY & COMPANY (2020), PUTRA ET AL. (2020), PwC (2020b), RAPACCINI ET AL. (2020), SEETHARAMAN (2020), SHETH (2020)
9. building organizational culture	CASALINO ET AL. (2020), D'ALIZZA AND DARRELL (2021), DELOITTE (2020)
10. implementation (including sustainability aspects)	DI VAIO ET AL. (2020), HUY (2020), PATUELLI ET AL. (2021), SCHALTEGGER (2020)
11. management and leadership (including risk management, innovation and knowledge management)	ALMEIDA ET AL. (2020), CASALINO ET AL. (2020), GARCÍA-MADURGA ET AL. (2021), HAMILTON (2020), KRAMMER (2021), LUNGU ET AL. (2021), McKINSEY & COMPANY (2020), PUTRA ET AL. (2020),

	PWC (2020b)
12. control mechanism	X
13. change management (including adaptability, resilience, agile change management, digital transformation)	ALMEIDA ET AL. (2020), CASALINO ET AL. (2020), COOMBS (2020), D'ALIZZA AND DARRELL (2021), DELOITTE (2020), HAMILTON (2020), IBM (2020), IFC (2021), KAMAL (2020), KRAMMER (2021), LUNGU ET AL. (2021), PATUELLI ET AL. (2021), PUTRA ET AL. (2020), RAPACCINI ET AL. (2020), SEETHARAMAN (2020)
14. feedback and learning	BATRA (2020), CASALINO ET AL. (2020), DELOITTE (2020), HUY (2020), SCHALTEGGER (2020)

Source: based on MAROSÁN (2006)

Looking at the table above, it appears that the selected references cover almost all the steps with their comments and suggestions.

As we can see the *5th step: comparison of alternatives/versions* and the *12th step: control mechanism* are missing in this listing. The possible answers for this could be as follows:

5th: in this rapidly changing environment (COVID-19) the comparison of different alternatives could seem to be unnecessary and resource wasting activity, because most of the companies are already satisfied if they can elaborate one proper strategic direction.

12th: the importance of control mechanisms is greatly underestimated in the literature and does not receive the attention it deserves. This situation can also be observed here. However, well-functioning control processes/systems serve the sustainability of systems (including enterprise systems as well) in either a financial or extended sense. In my opinion, the science of management should deal with control systems tailored to nonlinear structures in the near future. Like any other corporate activity, the operation of control can be a factor in competitiveness. Please, keep in mind that the traditional managerial control significantly differs in its nature and logic from the nonlinear control mechanism.

(2) Synthesis of the literature in the light of nonlinear management aspects of the pandemic

The following subsection presents the recommendations and core essences based on literature review regarding COVID-19 and post-COVID business era. The classification is based on paradigms described in the previous chapter (DINYA, 2008). All the suggestions can be used at traditional companies as well (Source: ALL LITERATURES listed in *Table 4.*).

Cultural Paradigm:

- innovation, innovative thinking, customer and stakeholder orientation,
- HR engagement, motivation, internal employees' wellbeing, health orientation, trust,
- companies that can spot problems when they look small, learn from them and build preventive measures rapidly possess what we would call a strong organisational immune system,

- clear vision, values, soft elements, optimism,
- social responsibility, join larger level visions, missions,
- recognizing the importance of social capital,
- commitment to environmental sustainability,
- risk and opportunity intelligence.

Management Paradigm:

- fostering digital transformation,
- HR capacity building focusing on digital skills, promote and enhance digital learning, new digital ways of working,
- launch and sustain a crisis command center,
- increasing efficiency of resources, sustainability (financial as well),
- increasing the quality of data management, privacy and cybersecurity capabilities,
- innovation: empowering and enabling environment within organization, support talents,
- new business models,
- disruptive technologies,
- intelligent data management,
- developing team competencies, internal structures/informal networks,
- financial sustainability (mentioned as a traditional management issue!)(create financial realism: increases flexibility rather than reduces it; simplifies planning by sharpening focus; it remains relevant in bad times as well as good.)(AXSON, 2020),
- redesigned risk assessment and management (how to manage uncertainty), rethinking of low-probability events, early warning system for environmental threats (BATRA, 2020 quotes TEECE ET AL., 2016),
- deep qualitative analysis and scenario planning should be complemented by simulations, AI, machine learning tools, mapping algorithms that could quantify different risks, big data, etc. (HUY, 2020),
- rapid response strategy, agile and holistic change management, adaptability is a mandatory business competency,
- resilient leadership, „coopetition” can be an effective business-to-business marketing strategy in a pandemic
- to create and sustain strategic resilience: encourage inspiration, innovation, and imagination.

Organizational Paradigm:

- developing organizational agility,
- reaching operational resilience,
- increasing user experience for our customers,
- holistic view, network thinking,
- taking into consideration the VUCA-environment (cultural, management and organizational paradigm in the same time),
- companies need long, sensitive feelers and hyper-responsive capability at all levels of the organisation to stay in the pink of health (HUY, 2020),
- building networks, innovation networks integrating government politics,
- the multigenerational relationship with the community, suppliers, and employees often saves the companies.

References to nonlinear approaches and management techniques abound in the literature analyzed, highlighting the impact of COVID-19 for the increasing necessity for such methods.

(3) The focus of the management responses of the Hungarian Blue Chip companies for the financial year 2020

The following table (*Table 5.*) summarizes the orientation of the most important Hungarian publicly listed companies in dealing with the COVID-19 crisis. It can be observed that the concentration pattern around the components (left column) does not match the areas covered in the literature (*Table 4.*).

Table 5: Components of the strategic management process and the distribution of the analyzed companies according to their reactions to COVID-19 (based on Annual Reports for 2020)

Steps of the strategic management process	Related companies
I. Strategic analysis	X
1. intentions and interests (vision, mission, values)	X
2. analysis of the external environment	4iG, ALTEO, Appeninn, AutoWallis, CIG Pannónia, Graphisoft Park, Magyar Telekom, MOL, OPUS Global, OTP Bank, PannErgy, Waberer's International
3. analysis of the internal situation	OPUS Global
II. Decision on strategic actions	X
4. elaboration of different versions (general goal settings, scenario planning)	ANY, MOL
5. comparison of alternatives/versions	X
6. strategic decision (strategic objectives)	Magyar Telekom, Masterplast
III. Strategy implementation	X
7. resource planning (including financial and efficiency aspects, capacity building, value	4iG, AKKO Invest, ALTEO, ANY, AutoWallis, CIG Pannónia, Magyar

chain planning, business models, HR aspects)	Telekom, MOL, OPUS Global, OTP Bank, Richter Gedeon, Waberer's International
8. shaping organizational structure (formal & informal)(including information flow structures, stakeholders, cooperation)	X
9. building organizational culture	OTP Bank
10. implementation (including sustainability aspects)	4iG, MOL
11. management and leadership (including risk management, innovation and knowledge management)	ALTEO, ANY, Appeninn, Graphisoft Park, MOL, PannErgy, Richter Gedeon
12. control mechanism	CIG Pannónia, Magyar Telekom
13. change management (including adaptability, resilience, agile change management, digital transformation)	4iG, ALTEO, ANY, CIG Pannónia, Magyar Telekom, Masterplast, MOL, OPUS Global, OTP Bank
14. feedback and learning	X

Source: based on MAROSÁN (2006)

Reviewing the Annual Reports of these companies, the implications of COVID-19 and their specific content, it can be stated that the linear–nonlinear transformation has begun, but not with the dynamics outlined in the literature (4iG, 2021, AKKO INVEST, 2021, ALTEO, 2021, ANY, 2021, APPENINN, 2021, AUTOWALLIS, 2021, CIG PANNÓNIA, 2021, GRAPHISOFT PARK, 2021, MAGYAR TELEKOM, 2021, MASTERPLAST, 2021a,b, MOL, 2021, OPUS GLOBAL, 2021, OTP BANK, 2021, PANNERGY, 2021, RICHTER GEDEON, 2021, WABERER'S INTERNATIONAL, 2021).

In the case of traditional companies (*e.g.* AKKO Invest, ALTEO, ANY, AutoWallis, Graphisoft Park, PannErgy, Waberer's), such measures appeared mainly which can be considered as classic crisis management responses (occupational health regulations, use of governmental financial support, rescheduling projects). While in the case of nonlinear actors using special inputs or regarding other players under transformation, the approaches and methods mentioned in the literature have also appeared (*e.g.* 4iG, CIG Pannonia, OTP Bank).

Some notable examples of the latter:

CIG Pannónia

In the field of digitization and IT developments, they have successfully introduced their IT system for remote identification. The first phase of education development ideas aiming the development of agile organizational and project operations has been implemented (CIG PANNÓNIA, 2021).

MOL

Through the eSMILE online learning platform, information about COVID-19 and occupational safety was provided to employees working with customers on a daily basis. MOL Group has leveraged its investments in previous years to switch to digital solutions to increase its internal training capacity (MOL, 2021).

OTP Bank

The bank provided large-scale donations to health care facilities, supporting several hospitals with medical equipment, including hospitals in disadvantaged areas of the country (social responsibility)(OTP BANK, 2021).

Of course, the success of crisis management and its real factors can be debated, but it is worth looking at the table below (*Table 6*). The change in the share price reflects the thoughts and opinions of investors regarding the real and expected success of the given company. 14. April 2020 refers to the starting period of the Special Legal Order and the State of Danger in Hungary, while 30. November 2021 is the closing date of this research.

Table 6. Changes in stock prices between the onset of the pandemic and 30. November 2021 (including % change also).

Name of the company	price of the share (HUF)(14. APR. 2020)	price of the share (HUF)(30. NOV. 2021)	change (%) (14. APR. 2020=100%)
4iG	467,5	930	198,93
AKKO Invest	400	423	105,75
ALTEO	730	1700	232,88
ANY	1230	1550	126,02
Appeninn	279,5	254	90,88
AutoWallis	76	121,5	159,87
CIG Pannónia	143,5	394	274,56
Graphisoft Park	4550	3850	84,62
Magyar Telekom	366	413,5	112,98
Masterplast	596	4200	704,70
MOL	2190	2416	110,32
Opus Global	280	233	83,21
OTP Bank	8900	17790	199,89
PannErgy	680	956	140,59
Richter Gedeon	8620	8550	99,19
Waberer's International	780	2390	306,41

Source: Budapest Stock Exchange

The Richter's stagnation and Masterplast's soaring in this regard are quite thought-provoking.

DISCUSSION

In conclusion, we can agree with TEECE ET AL. (2016), who noted: „*Strategic planning should be rather a learning and flexible process that enables organizations to adapt in constantly changing environments.*” Or in other words, strategic planning should be one key factor of an organization's performance to enhance its adaptation to both external and internal changes (BATRA, 2020 quotes TEECE ET AL., 2016). This interpretation is a good expression of what has been said so far.

This phase of work was about only the literature review of course further examinations and research are needed to see the real nature of the transformation processes traditional approach → nonlinear paradigm. This circumstance is also the limitation of this article.

The COVID-19 obviously accelerated and catalyzed this transformation and even in the case of traditional companies the new techniques/approaches listed earlier could be vital or essential to sustain their existence. This can also be observed in Hungarian Blue Chip companies, but this process is far from as fast as the literature suggests.

REFERENCES

- 4iG (2021): Üzleti jelentés – Egyedi Beszámoló.
https://www.bet.hu/newkibdata/128555629/4iG_uzleti_jelentes_IFRS_egyedi_2020_HU.pdf
- AKKO Invest (2021): Üzleti- és Vezetőségi jelentés.
<https://www.bet.hu/newkibdata/128553079/2021.04.15%20-%20AKKO%20Invest%20-%20%20C3%A9szleti%20%20C3%A9s%20Vezet%C5%91s%20C3%A9gi%20Jelent%C3%A9s%20konszi%20-%20al%20C3%A1%20C3%ADrt.pdf>
- Allen, P. M. (1988): Dynamic models of evolving systems. *System Dynamics Review*, Vol. 4, No. 1-2: 109–130.
<https://doi.org/10.1002/sdr.4260040107>
- Almeida, F., Santos, J. D., Monteiro, J. A. (2020): The challenges and opportunities in the digitalization of companies in a post-COVID-19 World. *IEEE Engineering Management Review*, Vol. 48, No. 3: 97–103.
<https://doi.org/10.1109/EMR.2020.3013206>
- ALTEO (2021): ALTEO Nyrt. 2020. pénzügyi évre vonatkozó Éves Jelentése – Egyedi (nem konszolidált) vállalat IFRS-ek szerinti beszámolója.
https://www.bet.hu/newkibdata/128550312/ALTEO_Egyedi_2020_HUN.pdf
- ANY (2021): Éves jelentés 2020. ANY Biztonsági Nyomda Nyrt.
<https://www.bet.hu/newkibdata/128555430/ANY210429AR01H.pdf>
- Appeninn (2021): Appeninn Vagyonkezelő Holding Nyilvánosan Működő Részvénytársaság Egyedi 2020. évi üzleti jelentés és vezetőségi jelentés.
https://www.bet.hu/newkibdata/128550643/20210409_Egyedi%202020.%20%20C3%A9vi%20%20C3%BCzleti%20jelent%C3%A9s%20%20C3%A9s%20vezet%C5%91s%20C3%A9gi%20jelent%C3%A9s.pdf
- AutoWallis (2021): Vezetőségi Jelentés és Üzleti Jelentés az AutoWallis Nyilvánosan Működő Részvénytársaság 2020-as év üzleti tevékenységéről.
https://www.bet.hu/newkibdata/128544915/AW_2020_Kulonallo_Vezetosegi%20Jelentes_alairt.pdf
- Axson, D. A. J. (2020): Making strategic planning relevant in an uncertain world. *Financial Management Magazine* 2020 Oct.
<https://www.fm-magazine.com/issues/2020/oct/make-strategic-planning-relevant.html>
- Batra, D. (2020): The Impact of the COVID-19 on Organizational and Information Systems Agility. *Information Systems Management*, Vol. 37, No. 4: 361–365.
<https://doi.org/10.1080/10580530.2020.1821843>
- Bennet, A., Bennet, D. (2008): The Decision-making Process for Complex Situations in a Complex Environment. In: Burstein, F., Holsapple, C. W. (eds.): *Handbook on Decision Support Systems*. Springer-Verlag, Berlin, Germany, pp. 3–20.
- Bennis, W., Nanus, B. (1985): *Leaders: Strategies for Taking Charge*. Harper & Row, Publishers, New York, NY, USA.

<https://archive.org/details/leadersstrategi00benn/mode/2up>

Boisot, M., McKelvey, B. (2011): Complexity and Organization-Environment Relations: Revisiting Ashby's Law of Requisite Variety. In: Allen, P., Maguire, S., McKelvey, B. (eds.): The SAGE Handbook of Complexity and Management, 16th Chapter. SAGE Publications, London, UK. pp. 279–298.

Bond III, E.U., de Jong, A., Eggert, A., Houston, M. B., Kleinaltenkamp, M., Kohli, A. K., Rither, T., Ulaga, W. (2020): The future of B2B customer solutions in a post-COVID-19 economy: managerial issues and an agenda for academic inquiry. *Journal of Service Research*, Vol. 23, No. 4: 401–408.

<https://doi.org/10.1177/1094670520960230>

Breier, M., Kallmuenzer, A., Clauss, T., Gast, J., Kraus, S., Tiberius, V. (2021): The role of business model innovation in the hospitality industry during the COVID-19 crisis. *International Journal of Hospitality Management*, 92: 102723.

<https://doi.org/10.1016/j.ijhm.2020.102723>

Brown, S. L., Eisenhardt, K. M. (1997): The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, Vol. 42, No. 1: 1–34.

<https://doi.org/10.2307/2393807>

Burns, T., Stalker, G. M. (1961): *The Management of Innovation*. Tavistock, London, UK.

Casalino, N., Żuchowski, I., Labrinos, N., Munoz Nieto, Á. L., Martín, J. A. (2020): Digital Strategies and Organizational Performances of SMEs in the Age of Coronavirus: Balancing Digital Transformation with an Effective Business Resilience. Queen Mary School of Law Legal Studies Research Paper Forthcoming,

<http://dx.doi.org/10.2139/ssrn.3563426>

Catmull, E., Wallace, A. (2014): *Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration*. Transworld Publishers Ltd., London, UK. ISBN 0812993012

CIG Pannónia (2021): Az Európai Unió által befogadott nemzetközi pénzügyi beszámolási standardok alapján készített 2020. évi egyedi pénzügyi kimutatások és üzleti jelentés.

https://www.bet.hu/newkibdata/128558785/CIG_Pannonia-IFRS_beszamolo_uzleti_2020-EGYEDI-HUN-210x297.pdf

Coombs, C. (2020): Will COVID-19 be the tipping point for the intelligent automation of work? A review of the debate and implications for research. *International Journal of Information Management*, 55: 102182.

<https://doi.org/10.1016/j.ijinfomgt.2020.102182>

Crick, J. M., Crick, D. (2020): Coopetition and COVID-19: Collaborative business-to-business marketing strategies in a pandemic crisis. *Industrial Marketing Management*, 88: 206–213.

<https://doi.org/10.1016/j.indmarman.2020.05.016>

D'Alizza M., Darrell, N. B. (2021): Managerial adaptability and business strategic change in age of COVID-19. *PSU Research Review*, in press.

<https://doi.org/10.1108/PRR-12-2020-0046>

Deloitte (2020): *Combating COVID-19 with an agile change management approach. A guide for organisations to prioritise people's needs while maintaining business continuity during uncertain times*. Deloitte Touche Tohmatsu India LLP.

- <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/human-capital/in-hc-consulting-deloitte-change-management-pov-on-covid-noexp.pdf>
- Dinya L. (2008): Szervezetek sikere és válsága. 2nd Edition, Akadémiai Kiadó, Budapest. ISBN 9789630582742
- Di Vaio, A., Boccia, F., Landriani, L., Palladino, R. (2020): Artificial intelligence in the agrifood system: Rethinking sustainable business models in the COVID-19 scenario. Sustainability, Vol. 12, No. 12: 4851.
<https://doi.org/10.3390/su12124851>
- García-Madurga, M. A., Grilló-Méndez, A. J., and Morte-Nadal, T. (2021): The adaptation of companies to the COVID reality: a systematic review. Retos Revista de Ciencias de la Administración y Economía, Vol. 11, No. 21: 55–70.
<https://doi.org/10.17163/ret.n21.2021.04>
- George, B. (2017): VUCA 2.0: A Strategy for Steady Leadership in an Unsteady World. Forbes Magazine, published on 17 February 2017.
<https://www.forbes.com/sites/hbsworkingknowledge/2017/02/17/vuca-2-0-a-strategy-for-steady-leadership-in-an-unsteady-world/?sh=522ea42413d8>
- Graphisoft Park (2021): Éves jelentés 2020.
https://www.bet.hu/newkibdata/128551139/GSPARK_IFRS_Eves_jelentes_2020_2021.03.18.pdf
- Hamilton, J. (2020): The strategic change matrix and business sustainability across COVID-19. Sustainability, Vol. 12, 15: 6026.
<https://doi.org/10.3390/su12156026>
- Hazy, J. K. (2008): Toward a Theory of Leadership in Complex Systems: Computational Modeling Explorations. Nonlinear Dynamics, Psychology, and Life Sciences, Vol. 12, No. 3: 281–310.
https://www.researchgate.net/publication/5339759_Toward_a_theory_of_leadership_in_complex_systems_computational_modeling_explorations
- Hill, L. A., Brandeau, G., Truelove, E., Lineback, K. (2014): Collective Genius: The Art and Practice of Leading Innovation. Harvard Business Review Press, Boston, MA, USA. ISBN 1422130029
- Huy, Q. (2020): Four Strategic Priorities for the Post-COVID-19 World. INSEAD.
<https://knowledge.insead.edu/blog/insead-blog/four-strategic-priorities-for-the-post-covid-19-world-14086>
- IBM (2020): COVID-19 and the future of business – Executive epiphanies reveal post-pandemic opportunities. IBM Institute for Business Value.
<https://www.ibm.com/downloads/cas/1APBEJWB>
- IFC (2021): How Firms are Responding and Adapting During COVID-19 and Recovery. Opportunities for Accelerated Inclusion in Emerging Markets. International Finance Corporation, World Bank Group.
https://www.ifc.org/wps/wcm/connect/08f1c445-87af-4868-a77c-29dee3e1ac4e/COVID-Emerging+Markets+Report_FIN_092021.pdf?MOD=AJPERES&CVID=nL5R-kF
- Kaisler, S. H., Madey, G. (2009): Complex Adaptive Systems: Emergence and Self-organization. Presented at: HICSS-42, Big Island USA, HI. January 5, 2009.
<https://www3.nd.edu/~gmadey/Activities/CAS-Briefing.pdf>

- Kamal, M. M. (2020): The triple-edged sword of COVID-19: understanding the use of digital technologies and the impact of productive, disruptive, and destructive nature of the pandemic. *Information Systems Management*, Vol. 37, No. 4: 310–317.
<https://doi.org/10.1080/10580530.2020.1820634>
- Kornelius, H., Supratikno, H., Bernarto, I., Widjaja, A. W. (2021): Strategic Planning and Firm Performance: The Mediating Role of Strategic Maneuverability. *Journal of Asian Finance, Economics and Business*, Vol. 8, No. 1: 479–486.
<https://doi.org/10.13106/jafeb.2021.vol8.no1.479>
- Krammer, S. (2021): Navigating the New Normal: Which firms have adapted better to the COVID-19 disruption? *Technovation*, in press.
<https://doi.org/10.1016/j.technovation.2021.102368>
- Kurtz, C. F., Snowden, D. J. (2003): The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM Systems Journal*, Vol. 42, No. 3: 462–483.
<https://doi.org/10.1147/sj.423.0462>
- Levy, D. L. (2000): Applications and Limitations of Complexity Theory in Organization Theory and Strategy. In: Rabin, J., Miller, G. J., Hildreth, W. B. (eds.): *Handbook of Strategic Management – 2nd Edition, Revised and Expanded*, Marcel Dekker, Inc., New York, NY, USA.
- Lungu, A. E., Bogoslov, I. A., Stoica, E. A., Georgescu, M. R. (2021): From Decision to Survival – Shifting the Paradigm in Entrepreneurship during the COVID-19 Pandemic. *Sustainability*, 13, 7674.
<https://doi.org/10.3390/su13147674>
- Magyar Telekom (2021): Magyar Telekom Távközlési Nyilvánosan Működő Részvénytársaság Éves Jelentés - A 2020. december 31-én végződő évről.
<https://www.bet.hu/newkibdata/128549415/IFRS%20Egyedi%20%C3%A9ves%20besz%C3%A1mol%C3%B3%2020201231.pdf>
- Marosán Gy. (2006): *A 21. század stratégiai menedzsmentje*. Műszaki Könyvkiadó Kft., Piliscsév. ISBN 9789631660081
- Masterplast (2021a): *A Masterplast Nyrt. Vezetőségi és Üzleti Jelentése 2020*.
<https://www.bet.hu/newkibdata/128556276/MP%20Nyrt%20%C3%9Czeti%20Jelent%C3%A9s%202020.pdf>
- Masterplast (2021b): *Masterplast Nyrt. Éves Jelentés 2020*.
https://www.bet.hu/newkibdata/128556276/MPGroup_%C3%89ves_Jelent%C3%A9s_HU_N_2020.pdf
- McKinsey & Company (2015): *The keys to organizational agility*.
<https://www.mckinsey.com/business-functions/organization/our-insights/the-keys-to-organizational-agility>
- McKinsey & Company (2020): *COVID-19: Strategies for getting ahead of the pandemic crisis*.
<https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/covid-19-strategies-for-getting-ahead-of-the-pandemic-crisis>
- Mérő L. (2018): *The logic of miracles: Making sense of rare, really rare, and impossibly rare events*. Yale University Press, New Haven, CT, USA. ISBN 9780300224153
- MOL (2021): *Magyar Olaj- és Gázipari Nyilvánosan Működő Részvénytársaság Anyavállalati Éves Jelentés*.
https://www.bet.hu/newkibdata/128547727/mol_annual_report_20210415_hun.pdf

- Morgan, G. (1997): Images of Organization. SAGE Publications, London, UK.
- Nagy S. (2015): Supreme Audit Institutions and New Aspects for Public Value Creation in Complex Adaptive Systems. In: Hetesi E., Vas Zs. (eds.) 2015: New Ideas in a Changing World of Business Management and Marketing. University of Szeged, Doctoral School in Economics, Szeged, pp. 206–224.
<http://eco.u-szeged.hu/download.php?docID=46208>
- OPUS Global (2021): 2020 Éves Jelentés.
https://www.bet.hu/newkibdata/128557778/OPUS%20GLOBAL_2020_%C3%A9ves_KO_NSZ_IFRS_20210430_HU.pdf
- OTP Bank (2021): OTP Bank Nyrt. 2020. évi Éves Jelentése (Tpt. szerinti).
https://www.bet.hu/newkibdata/128549003/210416_Eves_jelentes_032.pdf
- PannErgy (2021): PannErgy Nyrt. Éves beszámoló és Üzleti jelentés (EU IFRS-ek szerint összeállítva) 2020.
https://www.bet.hu/newkibdata/128549491/Eves%20Beszamolo_Egyedi_IFRS.pdf
- Patuelli, A, Caldarelli, G, Lattanzi, N, Saracco, F. (2021): Firms' challenges and social responsibilities during Covid-19: A Twitter analysis. PLoS ONE, Vol. 16, No. 7: e0254748. <https://doi.org/10.1371/journal.pone.0254748>
- Putra, I., Sunarsih, N., Novitasari, L., Setini, M. (2020): Exploring the relationship between social capital, innovation capability and innovation during the coronavirus pandemic. Uncertain Supply Chain Management, Vol. 8, No. 4: 857–864.
<http://dx.doi.org/10.5267/j.uscm.2020.5.007>
- PwC (2020a): Beyond COVID-19: Five key strategic priorities for a post-crisis world. PwC – PricewaterhouseCoopers network.
<https://www.pwc.com/gx/en/financial-services/assets/pdf/pwc-beyond-covid-19.pdf>
- PwC (2020b): Succeeding in Uncertainty: Responding to COVID-19. PwC New Zealand – PricewaterhouseCoopers network.
<https://www.pwc.co.nz/publications/2020/succeeding-in-uncertainty-responding-to-covid-19-nz-version.pdf>
- Rapaccini, M., Saccani, N., Kowalkowski, C., Paiola, M., Adrodegari, F. (2020): Navigating disruptive crises through service-led growth: The impact of COVID-19 on Italian manufacturing firms. Industrial Marketing Management, 88: 225–237.
<https://doi.org/10.1016/j.indmarman.2020.05.017>
- Renjen, P. (2020): The heart of resilient leadership – Responding to COVID-19. Deloitte Insight – Deloitte Development.
<https://www2.deloitte.com/us/en/insights/economy/covid-19/heart-of-resilient-leadership-responding-to-covid-19.html>
- Richter Gedeon (2021): Richter Gedeon Nyrt. nemzetközi pénzügyi beszámoló készítési standardok szerint készített Éves Beszámoló a 2020. december 31-ével zárult évről.
<https://www.bet.hu/newkibdata/128549275/%C3%89ves%20jelent%C3%A9s%202020.pdf>
- Ritter, T., Pedersen, C. L. (2020): Analyzing the impact of the coronavirus crisis on business models. Industrial Marketing Management, Vol. 88: 214–224.
<https://doi.org/10.1016/j.indmarman.2020.05.014>
- Schaltegger, S. (2020): Sustainability learnings from the COVID-19 crisis. Opportunities for resilient industry and business development. Sustainability Accounting, Management and Policy Journal, in press.

<https://doi.org/10.1108/SAMPJ-08-2020-0296>

Seetharaman, P. (2020): Business models shifts: Impact of Covid-19. *International Journal of Information Management*, 54: 102173.

<https://doi.org/10.1016/j.ijinfomgt.2020.102173>

Sheth, J. (2020): Business of business is more than business: Managing during the Covid crisis. *Industrial Marketing Management*, 88: 261–264.

<https://doi.org/10.1016/j.indmarman.2020.05.028>

Surie, G.; Hazy, J. K. (2006): Generative leadership: Nurturing innovation in complex systems. *E: CO Issue*, Vol. 8, No. 4: 13–26.

<https://journal.emergentpublications.com/article/generative-leadership-nurturing-innovation-in-complex-systems/>

Taleb, N. N. (2010): *The Black Swan: Second Edition: The Impact of the Highly Improbable: With a new section: „On Robustness and Fragility”*. Random House USA Inc., New York, NY, USA. ISBN 9780812973815

Teece, D. J., Peteraf, M., Leih, S. (2016): Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, Vol. 58, No. 4: 13–35.

<https://doi.org/10.1525/cmr.2016.58.4.13>

Uhl-Bien, M., Marion, R., McKelvey, B. (2007): Complexity Leadership Theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly*, Vol. 18, No. 4: 298–318.

<https://doi.org/10.1016/j.leaqua.2007.04.002>

VUCA-World.org: Leadership skills strategies VUCA World

<https://www.vuca-world.org/>

Waberer's International (2021): Egyedi Éves Beszámoló – 2020.

https://www.bet.hu/newkibdata/128558945/EGYEDI%20BESZ%3%81MOL%3%93_2020%20FINAL.pdf