HPC in business: the impact of corporate digital responsibility on building digital trust and responsible corporate digital governance

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Abstract

Purpose – *The implementation of high performance computing (HPC) in business (especially small and medium-sized enterprises) is accompanied with mistrust to a certain extent, which has imposed the need for building of digital trust (DTrust) among stakeholders. The purpose of the present paper is to find out the ways on how to build and maintain such trust.*

Design/methodology/approach – *Analysis and critical reflection on previous research dealing with phenomena of digital transformation (DT), HPC, corporate digital responsibility (CDR) and DTrust have enabled the authors to design their own conceptual model as the answer to the research questions of how, and in what way, CDR influences DTrust.*

Findings – *The authors have determined that the previous researches pointed to the existence of the correlation between CDR and DTrust although they did not elaborate on this explicitly. It was shown that the DT itself directly influences trust and sustainability. The indirect influence DT has via CDR was the task the authors undertook through designing a new conceptual model within whose frame the authors separately presented the influence of total CDR on DTrust as well as of the specific CDR dimensions on the particular dimensions of DTrust.*

Originality/value – *The authors tried to offer the conceptual model that exactly determines the relation of individual dimensions of the processed phenomena by analyzing theoretical and empirical researches carried out so far, and* eo ipso *shed more light on their mutual relation. The authors firmly believe that this paper offers a useful frame for further empirical researches.*

Keywords *CSR, HPC, Digital transformation, Corporate digital responsibility, Digital trust, Responsible corporate digital governance*

Paper type *Conceptual paper*

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1. Introduction

We live in a world that is affected deep and wide by *the process of digital transformation* (DT), enabled by digitization and digitalization. It creates a brand new business model using contemporary informational and computer technologies, which leverage the existing knowledge, changing organizational culture, management strategy, technological mix and operational set-up. In this context, Joyson (2020) stresses *time and values*, *health* and *privacy as well as trust* as important factors in a positive future. Nevertheless, even today DT has a strong impact on all sectors of society, especially the business world, facing them with a radical change, which is the consequence of rapid development of digital technologies. DT leads to even stronger global competition; hence, companies are racing to implement it as soon as possible and thus gain sustainable competitive advantage. DT represents *business transformation by means of new digital achievements and capacities*

for efficient digital development in digital world (Ziyadin *et al.*, 2020).We can say without reluctance that DT represents a *journey in its own right*. We are forced to follow it by several factors, such as, for example, digital consumers, requirement for operational agility, globalization, regulatory changes, digital technological advance and Generation Z.

Academic discussions have formed a number of DT models and classifications. It has become an indisputable fact that more aspects will have to be transformed, for example, business model, structure, people, processes, information technology (IT) ability, product and service offer and engagement in terms of the ways companies deal with their customers and other stakeholders (Wade, 2015). DT can be classified into four types: *radical transformation* (change of company's architectural design), *architectural transformation* (company's architecture changes, whereas the basic concept remains unchanged), *modular transformation* (company's architecture remains the same, but the core-design changes) and finally *incremental transformation* (company's architecture is redefined and its components are improved) (Safruddin *et al.*, 2014). However, it is important to point out that *different kinds of DT have different transformational needs*.

If used *unethically*, technologies that run DT *can lead to the collapse of stakeholders' trust*. Similarly, if used in a responsible and moral way, these can help build trust and benefit society. Some authors believe there are four pillars of digital trust (DTrust): *transparency and availability*; *ethics and responsibility* for the potentially dark side of technologies – using of tools for testing honesty and detecting favoritism, applying protective measures for promotion of stakeholders' well-being through morally proper use of technology; *privacy and control*; and *security and reliability* because of increasing cyber risk while relying on smart devices more and more (Albinson *et al.*, 2019). DT can provide exponential increase but can also disrupt business models. The result depends on *the degree of trust* stakeholders have. However, *technology itself cannot build trust*. Along with the aforementioned four pillars of trust, there is a necessity for the existence of adequate leadership, management model, strategy, principles, policy, process and culture in building of long-term trust relations with the stakeholders (Albinson *et al.*, 2019).

It is worth pointing out that DT of socioeconomic structures and processes represents the central challenge for the development of each company, as it results in the significant change of the corporate world, because it reaches deep into the fundamental perspectives of management, moving along with increasing the dematerialization of resources, processes and products. It increasingly penetrates all areas of an organization, changing the ways of its future governance. Schellinger points out that flexibility and individualization of economic relations connected with technological possibilities lead to additional and more complex processes of creating value added. *Agilization*, *individualization*, *laterization and holokratization* of managing relations and systems are revolutionary directions for a future with an increasing number of self-organized network organizations with advanced digital infrastructure. Accordingly, *digital corporate governance* (DCG) obviously represents a perspective of management development within the universal DT economy and society, as well as new business strategies for facing this kind of circumstances (Schellinger *et al.*, 2020).

Digitalization also has an important impact on *sustainability*, which implies catering to the needs of present generations, without depriving future generations of the opportunity to satisfy their needs. There is a difference among economic, ecological and social sustainability (Knaut, 2017). Sustainable corporate development aims precisely at the implementation of structures, processes and measures in accordance with this concept. In the meantime, the sustainability of a company has become an integral part of organizational culture and is seen as the measure of a company's overall success. Hence, the digitalization plays the key role in a company's successful transformation on the way to its sustainability (Pyka, 2017). Consequently, it creates new general conditions and represents a new management approach to sustainable business activity with new challenges. The

changes are reflected not only in technological innovations but also in innovations in business and manufacturing models and processes. The point is in improving sustainable entrepreneurship and creating a higher level of security through the use of technology in a manner easy to implement and understand. New technologies in an organization could lead to higher transparency and thus create more sustainability, responsibility and higher stakeholder engagement.

The DT process requires the abandoning of traditional skills/methods of management by means of introducing new ones. As processes focus on creating outputs to serve users' needs (Damij and Damij, 2014), this process has a strong impact on the change of corporate governance concepts through requirements for creating a frame for the implementation of the concept of DCG, which makes it possible for a company to react successfully to the challenges of digitalization by enabling a true realization of DT. Dynamic digital environment requires for a company's transition from a traditional approach to planning an agile management approach: moves are made very swiftly; the organization can learn from its own acquired experience. DCG becomes successful through networking (by means of communication and work), openness (organizational culture based on experiment and error tolerance), participation (of the employees) and agility (flexibility and speed).

2. Place and role of high performance computing in global business

What brought momentum to the process of DT was the introduction of high performance computing (HPC). Voevodin (2019) in the spirit of the US Council motto on Competitiveness – "to out-compete is to out-compute – establishes a Hamletian alternative, which says you either have to be the leader in this sphere (i.e. at least possess such technologies) or you will inevitably be the loser. Thus, using of *supercomputer technologies* represents one of the most important sources of competitive advantage of companies, industries and whole national economies. Key reasons supporting this technology are seen in cost reduction, quicker market entry, more precise and swift solving of old and new problems. This technology enables putting into motion other technologies as well as a revolutionary development of numerous areas of today's society. In short, HPC is used in the world of business today because of its capability of *resolving huge computer problems in reasonable time limits and reasonable cost parameters*. HPC possesses a great potential which includes the improvement of efficiency ("solving a problem faster"), effectiveness ("solving a problem of larger size and/or with enhanced quality") and robustness ("solving a problem in a way that makes the solution robust against changes") (Schryen, 2020).

The increasing use of HPC in business enables the calculation of complex economic problems by means of *approximating huge-dimensional functions and systems of nonlinear equations* (Eftekari *et al.*, 2020). An obvious field of their implementation are *(big) data and machine learning*, where enormous quantities of data obtained from sensors, mobile phones and social networks for analysis and description of phenomena, development projections and informing strategic decisions were analyzed (Schryen *et al.*, 2020). Availability of vast quantities of data and enormous possibilities of HPC in the sphere of processing capabilities, new machine learning and data mining approaches and new software frameworks for data processing has led to research activities for business analytics and analysis of social networks. This enables the transfer from *offline analytics to real-time analytics* (Wang *et al.*, 2016). Furthermore, in the areas of management science and operational research, computing clusters are used to perform parallel algorithms for a large number of theoretical and practically relevant problems (Aldasoro *et al.*, 2017). Practical implementation of *High Performance Business Computing* in the business sphere is useful and needed due to the fact that the spheres of business research and economy are becoming more and more *computational*. Computing centers of universities, public cloud providers and open source communities offer HPC infrastructure as commodity

goods. And finally, the end has come to the domination of the single microprocessor in computing, which was the promoter of economic and technological progress in recent decades. Also, everything points to the following: "a) future enhancements in computing performance will come methodologically primarily from *parallelization*, b) business research and economics need to exploit computational performance enhancements to address several of its problems more effectively and efficiently, and c) massive parallel computing and HPC capabilities become *commodity goo*ds for researchers" (Schryen *et al.*, 2020).

HPC centers continually tend to improve the effectiveness of their resources and services to best serve their constituencies. Being the first system available to *open science providing sustained-petascale capability*, Blue Waters distinguished itself while facing numerous new challenges, because it offered best practices for deployment and full-service operation. Main areas of good practices are: project management; deployment, operations and system management; support models; communicating success; and widening of existing communities and incorporating the new ones together with the workforce (Lathrop *et al.*, 2018). Meanwhile, it turned out that HPC technologies solve problems using numerical methods, with obtaining approximate results, which have errors significant enough and in which *estimating limits is often more difficult than technical calculus*. Gabrin and Shepelev stress that HPC possesses a series of characteristics, whose ignorance creates *(too) big expectations from their use* (Gabrin and Shepelev, 2012).

Despite the criticism (Netto *et al.*, 2018), *cloud computing* is increasingly becoming a faster, better and cheaper solution compared to on premises, and companies (including small and medium-sized enterprises (SMEs)) will have to adopt it to stay competitive in the global market, because they set in motion *agility*, *faster innovations and just-in-time procurement*: Cloud HPC data are more easily distributed among main workflows. Furthermore, HPC platform together with integral cloud offers *expandable and traceable cloud experience*, which can be wisely integrated in a large number of companies, to which traceability is crucial for the trade-off computing and risk management. Finally, cloud computing enables "as a service" economy for HPC, as it provides a robust partner ecosystem for mutual innovations. Openness and decentralization of HPC architecture represent key factors in the development of the "as a service" economy and, at the same time, offer better consumer and partner experience (Rescale, 2019).

In short, the DT process in which, as previously discussed, the use of HPC technologies plays the vital role has many challenges. This paper will primarily deal with the ethical ones.

3. Corporate digital responsibility

In the corporate context, we often speak of *sustainable corporate development* or *sustainable development* (Lazaretti *et al.*, 2018). Such an approach is frequently applied as part of the concept of *corporate social responsibility* (CSR). Nowadays, companies, including SMEs, are expected not only to make profit but also to show social responsibility (Jelovac, 2012). The concept of CSR denotes the willingness of a company to deal with different social groups (active participants) and inclusion of their interests in the measures of its social responsibility (Mast, 2013). CSR is reflected in a company's responsibility to make a positive influence on the society in the field of social, economic and environmental issues (European Commission, 2019). Within the frame of ISO 26000, standard guidelines for social responsibility have been developed for companies to use these to achieve stability in business and to tackle social, environmental, legal, cultural and political issues in a responsible and sustainable way (ISO 26000:2010, 2017). Three main areas that encompass responsibility can be singled out: *economic*, *environmental and social*. Hence, the terms corporate sustainability or CSR are linked to the requirement that companies do something for the public good. Although these two terms are closely connected, the concept of corporate sustainability differs from CSR – these did not come to life at the same time and they come from two different scientific areas: sustainability originates from systems

theory, whereas CSR comes from business ethics and normative economics, as it is connected to the "normative claim that in the process of decision-making the consequences of entrepreneurship activities on present and future generations must be accounted for" (Meffert et al., 2019). In the following lines we are going to discuss the second term.

The concept of CSR has been attracting more and more attention and has been given a strategic significance over the recent years. Lischka (2019) points out: *moral* motif, which stems from observed ethical obligation in terms of serving the interests of all stakeholders beyond those of the company's (the so-called entrepreneurial philanthropy) (Godfrey, 2005); and b) *instrumental* motif, which refers to strengthening a company in achieving corporate aims by trying to meet the requirements of stakeholders as well as successfully maintain good relations with them (Shiu and Yang, 2020). When defining the aspects for which a company ought to take the responsibility within its business activity, nowadays the complete stakeholders' approach to responsibility has to be taken into consideration. Thus we believe that immanent connection between a company and social responsibility of its stakeholders, who all basically have contradictory interests, desires and needs, must lead to *the balancing* in such a way that each and every one of them gets a fair share of profit, on one hand, and "maximization" of profit, on the other. Economic organizations, especially SMEs, must never lose focus on their core business because of CSR, nor must they forget CSR because of the focus. It should be heavily stressed that CSR represents a key source of competitive advantage, taking into account past experience of those companies that have successfully implemented this concept (Ljubojević *et al.*, 2012).

We firmly believe that the digital age cannot be deemed successful without making digitalization *sustainable*, acknowledging human dignity, participation, variety, well-being and quality of life. It is becoming more and more obvious that digitalization constitutes *a challenge for humane*, *fair and ecologically acceptable development* because of possible digital abuse. Numerous ethical dilemmas appear, referring to the transfer of human assignments to machines, limiting freedom with personal assessment, profiling or other forms of network manipulation, losing social trust because of fake news or social bots, fear of losing jobs, of "enslavement" by artificial intelligence (AI). Digitalization, thus, not only transforms markets, the working environment and everyday life of consumers, but it also forces companies to meet new CSR-related requirements put forth. Digitalization and sustainability are the factors that influence the global economy in different ways, in terms of digitalization being based on an unstoppable technological development, on one hand, and sustainability representing the balance between consumption and reproduction followed by high quality of life, on the other (Dörr, 2020). We feel it extremely important to point out that digitalization can improve or reduce sustainability thus creating additional social challenges. CSR models have to give necessary importance to digitalization. The requirement that CSR should be integrated into business models is becoming more and more topical and relevant. In that sense, CSR ought to understand and reflect the changes of business models, especially the ones that stem from the implementation of digitalization whose consequences all stakeholders will be facing up to (Knaut, 2017). This shows that the strategy of DT harmoniously fits into the concept of CSR. Knaut suggests transferring the triple of CSR – Environment, Social, Economic – to a quadruple – *Environment*, *Social, Economic and Digital*. Digital will become the fourth column of sustainability (Knaut, 2017). Thus CSR has to deal with the question *how to use the concept of sustainability in the digital age* where we may recognize five main aspects: we must learn to share; we lose control; we must change constantly; mobility; and we need leadership (Knaut, 2017).

Technological companies are under constant pressure to use digital technologies or process data in a way that manifests *ethical* responsibility while coding or managing data. Corporate digital responsibility (CDR), according to Wade (2020) represents an assemblage of practices and behaviours that help an organization use data, digital technologies in a way that is socially, economically, technologically and ecologically

responsible. CDR stands in for the compound of ethical aspects on both the individual and social level, bearing in mind that technological changes may give birth to either utopian or dystopian future (Joyson, 2020). CDR encompasses four areas – *social*, *economic*, *technological* and *environmental* – which ought to be integrated on the level of the organization which takes responsibility for the consequences of its business processes, products and services for stakeholders and society in general (Wade, 2020).

Eliminating and reducing negative influences of digitalization should contribute to the realization of the company's competitive advantage. The implementation of CDR strategy brings several significant advantages for the company itself, such as: shaping its own future provided DT is realized in a responsible way; improvement of reputation through building trust and positive internal and external perception of the company; building competitive advantage – gained trust attracts and binds not only consumers but also investors and other stakeholders; and motivating the employees, which increases their cohesion and productivity (ConPolicy, 2021). Faced with huge amount of data-generated DT, companies today face fourfold responsibility controlling those data, in other words, their *protective, legal, managing and ethical responsibility*. Beside regulatory responsibility, concerning data protection, ethical one, referring to software for AI, and social one, which deals with data managing, workplace transformation, type of data sharing and involvement of all stakeholders, there is also environmental responsibility, which deals with the use of data for assessment of influence of business activities on our environment (France Strategie, 2020).

4. Digital trust

More and more companies are realizing that the digital age brings both hardships and huge competitive advantages when it comes to building and maintaining strong *trust* of their stakeholders. When establishing relationships with stakeholders, companies may expect huge competitive advantages. We define trust as "our readiness to be vulnerable to action of others because we believe they have good intentions and that they will treat us accordingly" (Sucher and Gupta, 2019). A distinction can be drawn between *institutional trust*, referring to trust in formal institutions and *social trust*, referring to our faith in people (Algan, 2018) The latter is of a special significance, bearing in mind that it binds and secures that societies, economies and systems can function properly. Business leaders should take into account the need of each of four dimensions of trust: *physical*, *emotional*, *financial* and *digital*. As for DTrust, buyers and communities should believe that *cybersecurity* is priority and their transactions and data – accurate, safe and private (Lee *et al.*, 2020).

DTrust is associated with trust in digital institutions, digital technologies and platforms, which, in other words, means the user's trust in the capability of digital institutions, companies, technologies and processes to create a safe digital world. This primarily goes for the trust consumers and other stakeholders have in companies to protect their personal data and provide customers' privacy. DTrust is something you can influence but cannot control. It builds consumer loyalty and is crucial for the development and maintenance of positive, long-term relationships with stakeholders. Established trust represents a powerful tool for generating new products and building long-lasting relations. DTrust stands in for the concept that defines trust in reliability of all components of digital interaction: of users, processes, devices, technologies and suppliers (Orekhova, 2020). In our opinion, because of the influence of DT on all areas of life, a necessity has arisen for studying the phenomenon of trust in products of digital economy in an interdisciplinary capacity.

Orekhova (2020) distinguishes the following aspects of positive influence of high-level trust: facilitating coordination of interests of participants in economic transactions, intensifying exchange of information and cooperation in innovative sphere; reducing investment risks of large programs and projects based on reduction of future uncertainty in connection with weakening the threats from opportunistic attacks; reducing transaction costs of surveillance

and control, minimizing costs of ownership rights protection, mitigating burden on the legal system and increasing its legal capability; and on the basis of balanced growth model it has been determined that a *society with a low level of trust is more endangered by the trap of poverty*.

Undoubtedly, *trust is the key resource in a digital economy*; it is the key factor which determines the competitiveness of a digital economy. The development of a digital society and digital economy is simply impossible unless there is a high level of trust among all participants. Digital tools that enable DT business activities are mainly connected to Cloud technology. The Cloud itself represents the lever of digital business, because it gives the speed needed by agile management to test, retest, rethink and reinvent customer and workplace resources (Hurley, 2018). The use of HPC technology by using Cloud technology allows companies (especially SMEs) to broaden the limits of customer intimacy, product leadership and operational excellence. Alongside lower capital expenses, according to Hurley (2018), speed, agility and approach to digital tools are of crucial importance for DT. Cloud technology, together with HPC technology, offers the speed needed for introduction of new cost leadership, product leadership and customer intimacy. Decentralization is reflected in decentralization of applications and data for servicing local markets and buyers. As for the scale, it allows companies to scale without large initial capital expenses. When it comes to volume, digital processes and information are *transformative and elastic*, which enables the using of this service to all companies, regardless to the size and nature of their DT.

When referring to DTrust in the DT process, it stands for the hub of journey. Trust in digital business is acquired by stakeholders during digital interaction with a company. DTrust surpasses custody over stakeholders' data, as it is characterized by the following key attributes: *convenience*, *user experience*, *reputation*, *transparency*, *integrity*, *reliability* and *security*. Although DTrust may differ in different companies, as well as its use as the market differentiator in gaining competitive advantage on the global market, those companies that neglect DTrust, digital identity and rights are in the risk of becoming *digital dinosaurs* (Hurley, 2018).

The belief in *cloud providers* is a presumption of security while using such services although cloud providers will never completely adapt their environment to the needs of digital security and protection from cyberattacks. The organizations that wish to accommodate their culture to better DTrust face numerous challenges. On the basis of a recent study carried out by Abracham *et al*. (2019) among IT experts on types of behaviour and attitudes of different types of companies, the researchers found four techniques which organizations may use to map their road to trust. It goes from *culture of ignorance and neglect*, c*ulture of defiance*, c*ulture of compliance* with positive regulations to c*ulture of integrity*. The very essence of culture of integrity is reflected in: building of DTrust which is integrated in the company's strategy; advocacy on overcoming of laws and regulations through moral behaviour and education of service users on challenges of digital business; accepting successful positive practice of using and selling data and rewarding employees' behaviour; and taking preventive measures in privacy and data protection (Abracham *et al*., 2019).

According to Accenture research (Lewren and Sher-Hadar, 2014), DTrust represents the central spot in relations with not only consumers but also other stakeholders. They point out four keys for DTrust: security, reliability, privacy and control of data, benefits and values. Whether it is about internal or external stakeholders, the maintaining and improving their trust represents the essential part of corporate culture responsibility (Lobschat *et al*., 2019). Strong DTrust helps brands to attract and keep consumers, offer new products and services and also to gain better position in the wider range of goods and services value.

In short, the entire organization has influence over the building of the very sophisticated phenomenon of DTrust. In that sense, the building of CDR, along with the existence of two

main pillars – DT and DCG – can, in our opinion, is the guarantee for the successful building of strong DTrust.

5. Conceptual model for research of corporate digital responsibility impact on digital trust in responsible corporate digital governance (RCDG)
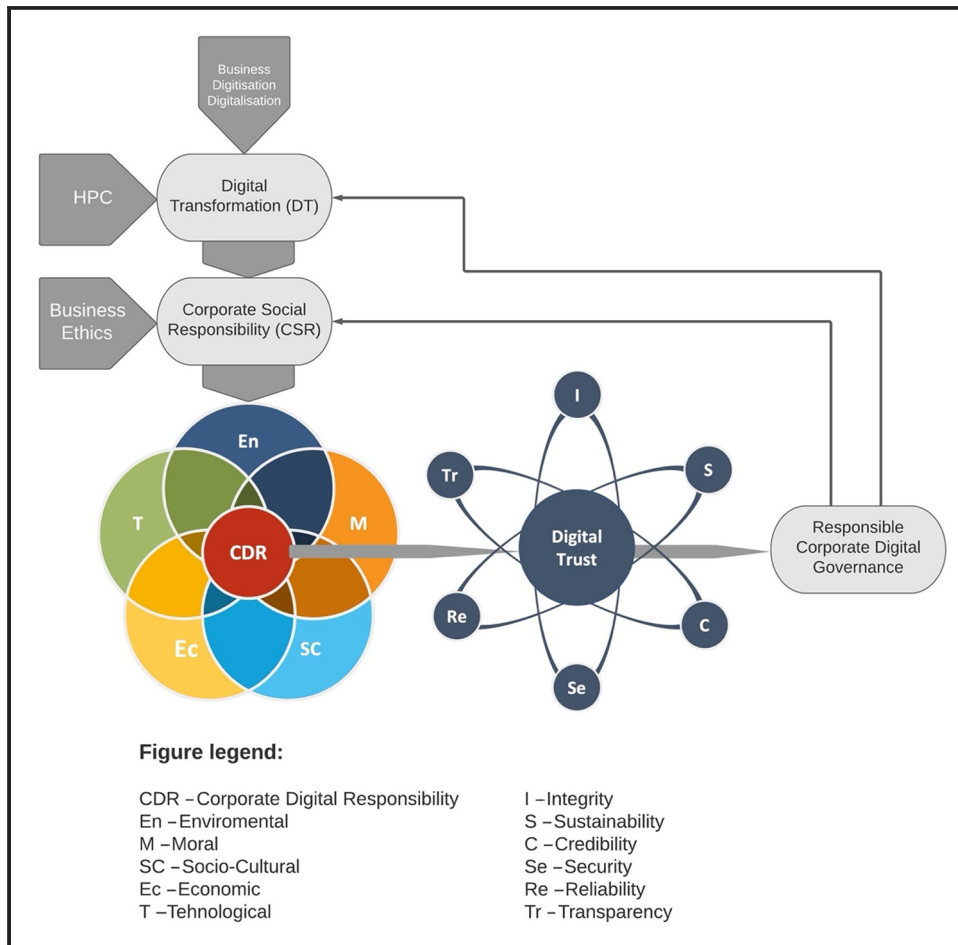
If we focus our interest on the mutual relationship between CDR and DTrust, we will see that previous research shows mainly sporadic indications of CDR positive influence on building and maintaining of DTrust. Critical reflection on literature dealing with DT, CDG, CDR, DTrust and sustainability in previous chapters of this paper laid the foundation on which we can now shape and offer our own conceptual model that will be the basis for further empirical research, which we intend to carry out in the future.

To establish mutual relationships between CDR and DTrust dimensions, it was not difficult to notice the existence of numerous distinctions in an organization's scope of activities aiming at responsible behaviour in the sphere of digital technologies. Tonn (2020) points out three areas: digitalization (providing of work–life balance and health), data (increasing employees' engagement and social well-being) as well as automatization and AI (keeping people in the centre of business transformation). Grigore *et al.* (2017) accentuate new areas of companies' responsibility in digital economy as follows: first, digital products, contractual agreements and ownership problems; second, exploitation of non-material work and fair reward distribution; third, approach and equality in use of digital technologies; and finally, responsibilities concerning the use of low costs or AI. Lischka (2019) speaks of three areas of CDR: sustainable development, green IT, trust and transparency and social responsibility. Christopher (2018) speaks of areas covered by CDR: digital accessibility, digital inclusion, digital convenience, sustainable automatization, unbiased AI, digital influences, data ownership, well-being. In our opinion, the concept offered by Wade (2020), on which we have already elaborated above (see above Section 3), is the most acceptable for implementation in the context of using HPC technologies in the business sphere.

Bearing in mind its influence on future behaviour of consumers who have trust in an organization, maintaining reliability is in the centre of CDR. Keeping promises, for example, concerning safety of clients' private data, makes the basis for building trust. *The digital age with its nature bestows reduction of trust levels with all participants.* Consistent keeping of promises is becoming a complex issue, taking into account the impossibility of keeping promises in all situations. And trust is the basis for every functional relationship, both in analogue and digital worlds. The digital world does not imply just human relations but also the ones between humans and machines and between machines and systems. Improving buyers' trust, not only through products and services but also in all basic purposes and principles, represents the key factor of a company's success. As for the previous research on DTrust, we can especially outline KPMG (2015) and Accenture (2016) as well as Hurley (2018), Albinson *et al.* (2019), Abracham *et al.* (2019), Dickson (2020) and Kiser (2020). Although the latter highlights five measures for trust evaluation: well-being, accountability, transparency, fairness, user data rights, according to Dickson (2020), there are five elements of trust: risk, security, compliance, ethics and social responsibility and privacy. As in our opinion the KPMG study presented trust dimensions in a comprehensive way, we decided to adopt the following trust dimensions for our conceptual model: *transparency*, *security*, *credibility*, *reliability* and *integrity*. Bearing in mind the character and nature of the process of offering services with HPC technologies in business, no matter whether it is in cluster or cloud form, we came to several key relations between CDR and DTrust (Figure 1).

The technological dimension in the figure above includes responsible creation of digital technology itself, starting with incorporating adequate cybersecurity protection into digital products, to securing that AI decision-making algorithms do not lead to creating unfair or discriminatory practices. For implementation of HPC technology in business this dimension is, in our opinion, the key one. It also encompasses most elements which need to be dealt

Figure legend:

CDR – Corporate Digital Responsibility
En – Enviromental
M – Moral
SC – Socio-Cultural
Ec – Economic
T – Tehnological

I – Integrity
S – Sustainability
C – Credibility
Se – Security
Re – Reliability
Tr – Transparency

with while building the culture of DTrust. For HPC technology in business, the following key elements are essential: ethical algorithms, protection and reaction in the field of internet security, acknowledging responsible practice of trust and validity of data storage. In our model, the technological dimension has influence on security, credibility and reliability as the elements of DTrust. Security should raise the consumers' trust only if digital service is secure. Credibility is reflected in keeping promises and fulfilling obligations and credibility in authenticity and availability.

The social dimension stands in for a company's relationship with people and society. It represents the key component in responsible and transparent data gathering and processing. Taking account of their ethical principles, companies put clearly defined restrictions on using data and comprehensively inform data owners about the ways of collecting data and the intent and purpose of gathered data. This dimension promotes digital diversity and inclusion. As for the HPC technologies in business, two elements stand out here: data protection and socio-ethical practices. The social dimension in our model influences transparency as a dimension of DTrust, within which consumers and other stakeholders have sufficient insight into the ways their data are used.

Economic influences of digitalization and DT are reflected in their effects on economy, first, in the influence of automatization on workplaces, and then, in sharing of economic benefit of digitalization with society. One area of rapid growth and development are digital currencies

and the distributed ledger blockchain technologies ushering in a decentralized world in which corporate governance structures will need to adapt to remain relevant, achieve full potential and "offer greater convenience, accountability, and trust" (Fenwick and Vermeulen, 2018, p. 25). As for the HPC implementation in business, this dimension is reflected in respecting data ownership rights through piracy reduction. Its influence on DTrust ought to be expressed through the influence on reliability.

The environmental dimension is reflected in the physical environment through restriction of energy consumption, prolonging the life span of devices and their responsible storaging and recycling. As for the HPC technologies that require large electrical energy consumption, it is necessary to tackle this problem by creating innovations that lead to reduction of the resource used or by finding renewable energy sources for running HPC technology. The influence of this dimension is reflected in building and improving of integrity. Integrity as a dimension of trust says that companies show they act in the best interest of consumers and other stakeholders.

Establishing and maintaining DTrust under the impact of CDR results in RCDG, which has a feedback, not only on building CDR and DTrust but also as a key player in the company's DT process. Responsible and successful DT is at the same time a prerequisite for building CDR. RCDG is expected to successfully lead the process of changing the corporate and organizational culture for the sake of long-term creation of new added value. An important role of the company's culture is business ethics. Finally, CDR is essentially dependent on corporate leadership responsibility. RCDG is a powerful mechanism for building a CDR culture and a culture of trust.

The proposed conceptual model represents the basis for extensive empirical research and implementation in the domain of calculating the degree of consumer and other stakeholder trust built in the discourse of CDR. In the following period, we intend to realize such form of research to check the validity of the proposed model.

6. Conclusion

The use of HPC technologies in business (including also SMEs) is, among other things, under the influence of trust which service users and other stakeholders have in such form of services. High degree of informational asymmetry between the participants in this form of business relationship additionally requires the building and maintenance of their trust. The best response to building and maintaining trust is, in our opinion, the building of a new modern business and organizational CDR culture, which implies, above all, responsible DT and CDG. Although CDR is a voluntary obligation, which follows after legal requirements and standards have been fulfilled, it is the very thing that can provide the difference that leads to business sustainability and realization of competitive advantage. Another area in which big data are transforming traditional governance into smart governance is public administration (Sarker et al., 2018). Although this is beyond the scope of our article, there have been recent discussions on the need to implement smart governance and big data not only in the academic and business worlds but also in public sector agencies to improve accountability and easy access to government services (Sarker et al., 2018).

Responsible DT implies building of CDG and, within its frame, implementation of the CDR concept by building responsible corporate culture. Analyzing previous research, the concept of digital organization implemented in this way ought to lead to the building and maintaining of DTrust. The proposed conceptual model, as a result of analysis and critical reflection on previous research, can be the basis for further research in the domain of building CDR culture organization as a mechanism for ethically responsible behaviour and building of stakeholders' trust. The model stands in for the review of influences of individual dimensions (and elements) of CDR on individual dimensions of DTrust. Empirical research, by implementing this model, would probably enable the assessment of its validity. Besides,

the model would enable measuring of influences of individual dimensions of digital responsibility on dimensions of DTrust and on stakeholders' total trust. The application of this model in empirical research will surely be the subject of our future work.

References

Abracham, C., Sims, R.R., Daultrey, S., Buff, A. and Fealey, A. (2019), "How digital trust drives culture change", *MIT Sloan Management Review*, Vol. Spring, pp. 1-8.

Accenture (2016), "Digital trust: erase the trust paradox in banking", May 26, Accenture, available at: www.accenture.com/t20160529t211723__w__/us-en/_acnmedia/pdf-20/accenture-banking-tech-vision-digital-trust.pdf (accessed 4 October 2020).

Albinson, N., Bulahi, S. and Chu, Y. (2019), "Building digital trust: technology can lead the way", Deloitte, available at: www2.deloitte.com/content/dam/insights/us/articles/6320_Building-digital-trust/DI_Building-digital-trust.pdf (accessed 6 October 2020).

Aldasoro, U., Escudero, L.F., Merino, M. and Perez, G. (2017), "A parallel branch-and-fix coordination based matheuristic algorithm for solving large sized mulistage stochastic mixed 0-1 problems", *European Journal of Operational Research*, Vol. 258 No. 2, pp. 590-606.

Algan, Y. (2018), "Trust and social capital in for good measure: advancing research on well-being metrics beyon GDP", OECD. November 27, available at: www.oecd.org/publications/for-good-measure-9789264307278-en.htm (accessed 8 October 2020).

Christopher, J. (2018), "Corporate digital responsibility: principles to guide progress", July 11. Atos, available at: https://atos.net/en/blog/corporate-digital-responsibility-principles-guide-progress (accessed 28 September 2020).

ConPolicy (2021), "Corporate digital responsibility", Institut für Verbrauchtechik, available at: www.conpolicy.de/en/topics/corporate-digital-responsibility/ (accessed 3 October 2020).

Damij, N. and Damij, T. (2014), *Process Management: A Multi-Disciplinary Guide to Theory, Modelling and Methodology*, Spinger Verlag, Berlin-Heidelberg.

Dickson, F. (2020), "The five elements of the future of trust", April 22. IDC: Analyze the Future, available at: https://blogs.idc.com/2020/04/22/the-five-elements-of-the-future-of-trust/ (accessed 5 October 2020).

Dörr, S. (2020), *Praxileitfaden Corporate Digital Responsibility, Unternehnische Verantwortung un Nachhaltigkeitsmanagement im Digitalzeitalter*, 1st ed., Springer Gabler, Berlin.

Eftekari, A., Scheidegger, S. and Schenk, O. (2020), "Parallelized dimensional decomposition for large-scale dynamic stochastic economic models", *Proceedings of the Platform for Advanced Scientific Computing Conference*, Lugano, available at: https://dl.acm.org/doi/10.1145/3093172.3093234 (accessed 5 October 2020).

European Commission (2019), "Corporate social responsibility, responsible business conduct, and business & human rights: overview of progress", DocsRoom, available at: https://ec.europa.eu/docsroom/documents/34482 (accessed 5 October 2020).

Fenwick, M. and Vermeulen, E.P.M. (2018), "Technology and corporate governance: blockchain, crypto, and artificial intelligence", Law Working Paper N° 424, available at: https://ecgi.global/sites/default/files/working_papers/documents/finalfenwickvermeulen1.pdf (accessed 24 February 2021).

France Strategie (2020), "Corporate digital responsibility", 20 July Platforme RSE, available at: www.strategie.gouv.fr/english-articles (accessed 5 October 2020).

Gabrin, K.E. and Shepelev, G.I. (2012), "The analysis of supercomputer technologies use in social and economic problems, and innovative activity in building concept modelling formation", Social Science Open Access Repository, available at: https://nbn-resolving.org/urn:nbn:de:0168-ssoar-398696 (accessed 11 October 2020).

Godfrey, P.C. (2005), "The relationship between corporate philanthropy and shareholder wealth: a risk management perspective", *Academy of Management Review*, Vol. 30 No. 4, pp. 777-798.

Grigore, G., Molesworth, M. and Watkins, R. (2017), "New corporate responsibility in the digital economy", in Theofilou, A., Grigore, G. and Stancu, A. (Eds), *Corporate Social Responsibility in the Post-Financial Crisis Era*, Palgrave McMilan, Cham.

Hurley, J. (2018), "Digital trust – the foundation of digital transformation", April ISG Research Report, available at: www.unisys.com/Style%20Library/Unisys/usi2018/reports/DigitalTrust_TheFoundationofDigitalTransformation.pdf (accessed 12 October 2020).

ISO 26000:2010 (2017), "Guidance on social responsibility", available at: www.iso.org/standard/42546.html (accessed 3 October 2020).

Jelovac, D. (2012), "The impact of corporate social responsibility in the context of small and medium enterprise", *Innovative Issues and Approaches in Social Sciences*, Vol. 5 No. 2, pp. 21-35.

Joyson, C. (2020), "Corporate digital responsibility: principles to guide progress", 11 July Atos, available at: https://atos.net/en/blog/corporate-digital-responsibility-principles-guide-progress (accessed 6 October 2020).

Kiser, M. (2020), "Trust in numbers: an ethical (and practical standard) for identity driven algorithm", *Digitale Welt*, Vol. 4 No. 1, pp. 56-59.

Knaut, A. (2017), "How CSR should understand digitalization", in Osburg, T. and Lohrmann, C. (Eds), *Sustainability in a Digital World: New Opportunities through New Technologies*, Springer International Publishing, Cham.

KPMG (2015), "Digital trust", available at: https://assets.kpmg/content/dam/kpmg/pdf/2015/12/digital-trust.pdf (accessed 13 October 2020).

Lathrop, S., Mendes, C., Enos, J., Bode, B., Bauer, G., Sisneros, R. and Kramer, W. (2018), "Best practices for management and operations of large HPC installations", *Concurency and Computation Practice and Experience*, Vol. 31, p. 12.

Lazaretti, K., Giotto, O., Sehnem, S. and Bencke, F.F. (2018), "Building sustainability and innovation in organizations", *Benchmarking an International Journal*, doi: 10.1108/bij-08-2018-025.

Lee, T.J., Sniderman, B., Marquard, B., Gelletto, N., Geeanpersadh, P. and Cherny, M. (2020), "Embeding trust into COVID-19 recovery", Deloitte, available at: www2.deloitte.com/content/dam/insights/us/articles/6720_embedding-trust-into-covid-19-recovery/DI_Embedding-trust-COVID-recovery.pdf (accessed 13 October 2020).

Lewren, L. and Sher-Hadar, N. (2014), "The four keys to digital trust", Accenture, available at: www.accenture.com/t20150527T203143__w__/us-en/_acnmedia/Accenture/Conversion-Assets/Microsites/Documents14/Accenture-Four-Keys-Digital-Trust.pdf (accessed 8 October 2020).

Lischka, H.M. (2019), *Marktorientierte Unternehmenführung Und Geselllschaftliche Verantwortung: Beiträge zu Corpporate Social Responsibility Und Corporate Digital Responsibility*, Springer Gabler, Wisbaden.

Ljubojević, Č., Ljubojević, G. and Maksimović, N. (2012), "Social responsibility and competitive advantage of the companies in Serbia. MIC: managing transformation with creativity", *Proceedings of the 13th Management International Conference*, *Budapest*, pp. 22-24, available at: www.fm-kp.si/zalozba/ISBN/978-961-266-201-1/papers/MIC4206.pdf (accessed 8 October 2020).

Lobschat, L., Mueller, B., Eggers, F., Brandimarte, L., Diefenbach, S., Kroschke, M. and Wirtz, J. (2019), "Corporate digital responsibility", *Journal of Business Research*, available at: www.researchgate.net/publication/336262099_Corporate_Digital_Responsibility

Mast, C. (2013), *Unternehmenskommunikation*, UVK Verlagsgesellschaft, Konstanz/München.

Meffert, H., Burmann, C., Kirchgeorg, M. and Eisenbeiß, M. (2019), *Marketing – Grundlagen Der Marktorientierten UnternehmensfüHrung Konzepte – Instrumente – Praxisbeispiele*, Springer Gabler, Wiesbaden.

Netto, A.S., Calheiros, N.R., Rodrigues, R.E., Cuhna, F.L. and Buyya, R. (2018), "HPC cloud for scientific and business applications: taxonomy, vision, and research challenges", *ACM Computing Survey*, Vol. 52, pp. 1-19.

Orekhova, A. (2020), "Tsifrovoye doverie kak faktor razvitiya v usloviyakh turbulentnosti", Vestnik SGEU, 3;82, available at: https://cyberleninka.ru/article/n/tsifrovoe-doverie-kak-faktor-razvitiya-v-usloviyah-turbulentnosti

Pyka, A. (2017), "Dedicated innovation systems to support the transformation towards sustainability: creating income opportunities and employment in the knowledge-based digital bioeconomy", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 3 No. 1, doi: 10.1186/s40852-017-0079-7.

Rescale (2019), "Four ways to digitally transform with HPC in the cloud", 5 December Rescale, available at: https://resources.rescale.com/four-ways-to-digitally-transform-with-hpc-in-the-cloud/ (accessed 8 October 2020).

Safruddin, N., Rosemann, M., Recker, J. and Genrich, M. (2014), "A typology of business transformation. 360° – the", *Business Transformation Journal*, p. 1, available at:1.

Sarker, M.N.I., Wu, M. and Hossin, M.A. (2018), "Smart governance through bigdata: digital transformation of public agencies", *International Conference on Artificial Intelligence and Big Data (ICAIBD)*, *Chengdu*, doi: 10.1109/ICAIBD.2018.8396168.

Schellinger, J., Tokarski, O.K. and Kisslong-Näf, I. (2020), "Von der digitalen transformation zur digitalen unternermenführung", *Digitale Transformation Und Unternehnehmenführung*, Pringer Gabelr, Berlin, pp. 1-10.

Schryen, G. (2020), "Integrating management science into the HPC research ecosystem: how management science benefits from high performance computing", *Communications of the ACM*, Vol. 63 No. 9, pp. 35-37.

Schryen, G., Kliewer, N. and Fink, A. (2020), "High performance computing", *Business & Information Systems Engineering*, Vol. 62, pp. 1-3, available at: https://doi.org/10.1007/s12559-019-0622-2

Shiu, Y.M. and Yang, S.L. (2020), "Does engagement in corporate social responsibility provide strategic insurance-like effects?", *Strategic Management Journal*, Vol. 38 No. 2, pp. 455-470.

Sucher, S. and Gupta, S. (2019), "The trust crisis", Harvard Business Review, available at: https://hbr.org/2019/07/the-trust-crisis

Tonn, M.K. (2020), "Moving from CSR to CDR: narratives of CDR communication in the light of processes, mindsets and organizational culture change processes, mindsets and organizational culture", available at: www.academia.edu/43810255/Moving_From_CSR_to_CDR_Narratives_of_CDR_Communication_in_the_Light_of_Processes_Mindsets_and_Organizational_Culture_Change_Processes_Mindsets_and_Organizational_Culture (accessed 29 September 2020).

Voevodin, V.V. (2019), "Supercomputer technologies in the digital world: theory, practice, and education", *Herald of the Russian Academy of Sciences*, Vol. 89 No. 2, pp. 112-114.

Wade, M. (2015), "Digital business transformation: a conceptual framework", An IMD and Cisco Initiative, available at: https://doi.org/10.1002/ejoc.201200111 (accessed 9 October 2020).

Wade, M. (2020), "Corporate responsibility in the digital era", MIT Sloan Review, available at: https://sloanreview.mit.edu/article/corporate-responsibility-in-the-digital-era/ (accessed 3 October 2020).

Wang, Q., Li, B., Wang, P. and Yang, J. (2016), "Using TB-sized data to understand multi-device advertising", Proceedings of the international conference on information systems, Dublin, available at: www.semanticscholar.org/paper/Using-TB-Sized-Data-to-Understand-Multi-Device-Wang-Li/13b66050328cf9d9748e9e3bc9c59170c66bb975 (accessed 12 October 2020).

Ziyadin, S., Suieubayeva, S. and Utegova, A. (2020), "Digital transformation in business. Digital age: chances, challenges, and future", pp. 408-415, available at: www.researchgate.net/publication/334732448_Digital_Transformation_in_Business

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