

# GAME CHANGER – DEFINITION AND CLASSIFICATION: A HUMAN AND CHATGPT VIEW

## Introduction

Today, the term ‘game changer’ (GC) is becoming increasingly popular among researchers. It is used to identify scientific phenomena that are important for the development of a given field. At scientific conferences around the world, such as the 2022 Southern Oregon University (SOU) *Creativity Conference* in Ashland, Oregon, USA; and the 2023 Summer Management School in Kołobrzeg, Poland, there have been discussions attempting to define this phenomenon. On one hand, researchers compared GC to a ‘breakthrough’ [Rothberg, 2022], while on the other hand, they understand it very colloquially as a cause of changed rules of the game, linking it to instability [Sokołowski, Zięcina, 2018].

In literature, researchers also introduce the concept into scholarly papers rather casually. Authors identify it with various phenomena, such as new technologies [Azzutti, 2022; Rana et al., 2021] development of new products [Harouaka, 2014], new treatment methods [Sarang, Viswanathan, 2016; Kassem, Kamal, 2020], selection of medicines [Muñiz et al., 2021], teleworking [Krasilnikova, Levin-Keitel, 2022], new organizational solutions, and even crises [Loorbach et al., 2016], COVID-19 [Ansell et al., 2021], or the Y generation [Barclay, 2012]. Many authors limit themselves

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to calling the phenomena they analyze a ‘game changer’ without specifying what they actually mean by this term. An analysis of the content of research papers shows that they understand it as the cause of change in a particular environment, such as production systems, organizations, regions, methods of treatment, consumer behavior, employee behavior, etc. It is uncertain whether all the phenomena discussed and presented in the literature as GCs can actually be categorized as such. The lack of a clear scientific definition means that popular science jargon starts to expand in the literature, and the term ‘game changer’ is increasingly just a catchy element in the title of a paper, which is not explained in any way in its content [Patgiri, Ahmed, 2016; Hendershott et al., 2021].

On the other hand, the term ‘game changer’ is equated with change. This is particularly evident in studies analyzing the introduction of new technologies. A new IT tool, the introduction of innovations in data analysis, or the use of new technology is a starting point for introducing solutions that differ from those applied before, often changing the approach to solving contemporary problems [Kumbhar, 2017; Napolitano et al., 2022; Manocha et al., 2023]. In management science, change is seen as the mechanism that initiates organizational action, from strategy through innovation, risk, or organizational learning. Change management theory provides concepts and models that help implement change, most of which are reactive, discontinuous, and ad hoc in nature [By, 2005; Islam, 2023].

One of the most common topics relating to change within an organization concerns organizational adaptation [Sarta et al., 2021]. Adaptation viewed from the perspective of resource adjustment (RBV theory) or behavior (behavioral theory, evolutionary economics) is related to decision-making [Cyert, March, 1963; Davis, DeWitt, 2021]. In this context, researchers on the subject stress that adaptation depends on the strategic intent of the organization and can be variously viewed as performance [Lawrence, Lorsch, 1967], legitimacy [Meyer, Rowan, 1977], or survival [Hannan, Freeman, 1977], with a corresponding focus on what organizations can modify internally to achieve these outcomes under constraints.

Most studies on change to date have a reactive character, focusing on the effects rather than the causes of change. In our deliberations, we emphasize understanding the cause triggering change and acknowledge the need to discover its nature. We advocate viewing GC as a change inducer and stress the importance of awareness of the cause of change as an important element necessary to understand adaptation processes in an organization. The character of the phenomenon triggering the change shapes the organization’s strategies. This is an important starting point that is often neglected by researchers. Identifying the nature of the cause of change that affects the organization and the environment in which that organization operates is an important element determining effective decision-making. If the turbulence of the environment is local, its significance for the functioning of the organization is different than in the case of

global changes. This seems self-evident. In practice, managers focus on responding to change, i.e., action. They do not analyze the causes of change, but take adaptive measures. They do not analyze what triggered the turbulent environment, the extent of the turbulence, and the kind of effects that can be expected.

In light of the above observations, we note that there is no definition of the term ‘game changer’ in the literature, and we would like to supplement this. **The purpose of this paper is to define the term ‘game changer’ and develop a classification indicating the criteria of differentiation that will enable its better description.** Formulating a definition of a game changer will help us better understand the causes of change and distinguish them from non-game changers. Understanding what a game changer is will provide the information needed to make strategic decisions related to adaptation to change.

We believe that, like most definitions of modern phenomena, this one will also be ambiguous. Therefore, our goal is also to identify characteristic features of a ‘game changer’ and highlight the areas that differentiate them. Consideration of these criteria will enable the development of a classification of GCs that can be used to deepen knowledge of organizational adaptation and other phenomena determined by changes occurring in the environment.

To meet this goal, a four-stage dedicated methodology was developed using the tenets of grounded theory as a research strategy [Walker, Myrick, 2006]. This is an example of the creation of substantive theory [Glaser et al., 1968; Bryman, Bell, 2007; Charmaz, 2014] supported by qualitative research. Following the patterns of Sarta [2021], we introduce a combination of computer- and human-centered methods to systematically identify and contrast contributions while minimizing researcher bias. This combination involves both thematic modeling with different level of systematicity and systematic manual coding of manuscripts. For this purpose, methods such as scoping review [Teare, Taks, 2020], systematic research and review [Grant, Booth, 2009], state-of-the-art reviews [Grant, Booth, 2009], and flexible pattern matching [Bouncken et al., 2021] were used. This methodology was supported by analyzing the knowledge generated by ChatGPT chatbot developed by OpenAI, which uses the GPT model of machine learning. The tool was due to its capability for logical generalization of knowledge and the technical possibilities offered by new technologies that simulate intelligence. This tool was assigned an expert role and used to synthesize our analyses.

The findings section presents the results of each stage of analysis and discusses them in detail. The final steps that led to the establishment of levels and classification criteria based on the analyzed texts were: 1) inductive analyses of text samples (Table 1) to prepare Level I criteria as benchmarks for further division of the text set; 2) inductive analyses to refine Level 1 and Level 2 criteria; 3) analysis and matching of data from the literature review (Table 5) in conjunction with expert ChatGPT data using interactional navigation through the phrase set to match all elements from the

perspective of the same criterion 4) generalization and interpretation of the individual criteria of the obtained classification and theorizing related to the presentation of the definitions of each criterion (Table 6), which take into account the leading and distinguishing features assigned to a particular type of criterion.

The paper concludes with a brief summary of our considerations and highlights the contribution of our theoretical findings to the development of knowledge in the field of strategic management, particularly considering organizational adaptation. We also underscore the innovative approach to literature research methodology developed using grounded theory strategies, traditional and machine learning methods of text analysis, and the pioneering use of the analytical potential of machine learning applied in ChatGPT.

## 2. Methodology

In our methodology, we used the concept of grounded theory as a research strategy to generate theory from data [Khan, 2014; Glaser, Strauss, 1967]. Building a definition of GC was closely linked to a multi-stage research process, incorporating techniques such as theorizing, coding, theoretical saturation, and constant comparison [Konecki, 2000]. A detailed model of the adopted methodology is shown in Figure 1.

**Stage 1.** The specific goals of this stage were: **to initially identify the meaning of the term ‘game changer’ and to define GC.** For this purpose, a review of the Google Scholar database using the scoping review method [Teare, Taks, 2020] was conducted to enable a preliminary assessment of potential size and scope of available research literature. This approach aimed to identify the nature and extent of research evidence [Grant, Booth, 2009; Bowden, Purper, 2022]. Subsequently, additional criteria for analyzing the Google Scholar database were clarified, including the analysis of papers with high citation counts (at least 50). A relevance criterion was included, focusing on the analysis of the first 10 papers available in Open Access (OA) format or in SGH or PW databases. The frequency of use of the GC concept in these paper was analyzed to examine the extent to which the concept has been defined. No specific definition of GC was found. Based on the observed patterns from the texts reviewed, Level 1 induction codes were established and adopted as the basic criteria for distinction. These are: 1) contextuality, related to naming the phenomenon, and defining its type (**game changer type**); 2) influence related to the sphere in which the GC can be identified (**influence area**); 3) impact related to strength, territorial scope (**power impact**).

**Stage 2.** The specific goal of this stage was to **present the characteristics of a GC and determine its grouping criterion.** The method used for this purpose was systematic search and review [Grant, Booth, 2009], GC qualitative analysis, for which the set of texts analyzed was selected on the basis of titles, abstracts and

keywords from texts indexed in the SCOPUS database, one of the most reputable scientific databases. This method provided a comprehensive process of text selection in search of a broad purpose [Grant, Booth, 2009]. Narrowing down the search, the SCOPUS database was scanned by string (TITLE-ABS-KEY (“game changer”) AND TITLE-ABS-KEY (defin\*) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”)), which generated 70 records. After analyzing the availability of papers selected through systematic literature review, the number of records was determined to be N=69. Taking into account the results from stage 1, papers from various fields were included for further analysis, providing diversity relevant for qualitative research [Teare, Taks, 2020; Czakon, Czernek-Marszałek, 2021]. It was also assumed that a collection of 69 purposively selected texts describing GC was sufficient to address the research problem, provided that the studied phenomenon appeared in the texts as reliable descriptions and explanations reflecting its real meaning [Miles, Huberman, 1994].

Figure 1. Research methodology model

STAGE 1/Goal 1: Initial recognition of the meaning of "Game changer" and its definition	STAGE 2/Goal 2: Characteristics of GC, setting criteria for grouping	STAGE 3/Goal 3: The grouping criterion evaluation and establishing the structure	STAGE 4/Goal 4: Formulation of GC definition and classification
Data source: Google Scholar	Data source: SCOPUS	Data source: ChatGPT	Data source: knowledge from stage 1,2,3
Method: Scoping Review Sample: N= 10	Method: systematic search and review Sample: N=69	Method: State-of-the-art reviews Sample: N= 21 GC definitions generated by ChatGPT	Method: approach flexible pattern matching
Analysis criteria: 1. Keyword "game changer". 2. Citation (min 50).	Analysis criteria 1. "Game changer"+defin*=184 texts 2. Restriction "article"=72 3. Limit "English"=70 4. Due to text availability =69	Analysis criteria: 1. Open question: What does "game changer" mean? 2. A prompt containing the GC characteristics specified as the criteria for levels 1 and 2	Analysis criteria: 1. Level 1 and 2 criteria as the main features of GC 2. Inclusiveness and exclusivity of key GC features
Arrangements: 1. No GC definition	Arrangements: 1. No GC definition. 2. Interdisciplinarity GC	Arrangements: 1. New criterion for level 2	Results: 1. Long and short GC and non-GC definition. 2. GC Classification
Results: 1. Determination of GC similarities, initial GC clustering criteria for Level 1	Results: 1. Clarifying the criteria for grouping levels 1 and 2.	Results: 1. Structuring the GC definition. 2. Determining the properties of the GC definition.	

Source: own study.

In accordance with the interpretative paradigm [Bouncken et al., 2021], it was assumed that texts exploring GC would define the phenomenon or highlight its characteristics, allowing it to be distinguished from other phenomena commonly found in the environment. First, coding was carried out using Level 1 induction codes. As the texts were analyzed, these codes were refined into Level 2 induction codes assigned to each area, which served as a refinement of the criterion established at Level 1. By performing the inductive analysis process again, additional refining characteristics emerged for each criterion, which in our concept of GC classification constituted Level 2. And thus the first Level 1 criterion, type, was refined as 1.1 Technology; 1.2 Method; 1.3 Concept/idea 1.4 Phenomenon. The second Level 1 criterion, influence area, was refined as 2.1 Economic sphere; 2.2 Social sphere; 2.3 Economic and social sphere. The third Level 1 criterion, power impact, was refined as 3.1 Macro; 3.2 Meso; 3.3 Micro (Table 2).

The analyzed texts were additionally reviewed through a domain analysis of GC (by discipline), which demonstrated its interdisciplinary nature. Since some of the analyzed texts were assigned to multiple subject areas, all 69 texts were analyzed according to the indicated subject areas, resulting in a total of 127 analyses (Table 3). This process provided insight into the essence of GC in various contexts and addressed whether the perspective of the field affects the perception of GC. In other words, does the same GC, when analyzed from the perspective of another field of knowledge, maintain the same characteristics at Levels 1 and 2? This step was carried out to confirm the universality of the results obtained.

**Stage 3.** The specific goal of this stage was to **evaluate the grouping criterion and determine the structure of GC definition.** This stage aimed to generalize the results and its inclusion in the methodology was dictated by the results of scoping review (stage 1) and the systematic search and review (stage 2), where only the characteristics of the presented game changers were identified.

The analysis was carried out according to the methodology of State-of-the-art reviews [Grant, Booth, 2009], adopted to the analytical capabilities of ChatGPT and the GPT-3.5 and GPT-4 tools. Chat GPT (Generative Pre-trained Transformer) uses Machine Learning Models, such as Transformer XL, BERT, and RoBERT, which support pre-trained language models for machine learning. These models are often used for NLP (Natural Language Processing) and are enhanced by machine learning methods, including linear regression and neural networks [Zhang et al., 2023]. As its creators assure, GPT-4 is 82% less likely to respond to requests for disallowed content and 40% more likely to produce factual responses than GPT-3.5. GPT-4 surpasses ChatGPT in its advanced reasoning capabilities (<https://openai.com/product>). Two versions of OpenAI products were chosen to prepare the definitions to objectify the results obtained by using the different knowledge bases used in Open AI products. It should be noted that ChatGPT was used as a tool for intelligent text

synthesis from a preset knowledge base and as an expert working on its databases. Before including ChatGPT technologies, it was verified whether the language of communication influences the acquired content. To this end, one question was formulated: *What does “game changer” mean?* and asked in the ChatGPTv.3 app in different languages: English, Polish, Spanish, Chinese, and Slovenian. The research was carried out in March 2023. The purpose of this study was to discern whether the understanding of the term game changer in different languages is the same. To obtain a reliable answer, the definitions received in different languages were then translated by native speakers into English. A qualitative comparison of the resulting content showed no differences in meaning. However, it provided new material for analysis, i.e., 5 definitions and 5 examples of game changer generated from knowledge bases in different languages. This was additional material included in the analyses at this stage. This decision was made after finding differences in the examples generated by ChatGPT for the languages requested.

Based on the results from stage 2, a prompt was formulated with a request to prepare four definitions of GC and non-GC: one general and three specific. The prompt took into account Level 1 criteria. Long and short versions of the definitions were generated, resulting in  $n=8$  for GCs and  $n=8$  for non-GCs. Based on these results, the definition of GC was standardized by identifying its key elements through specific questions (Table 4). In accordance with the grounded theory strategy, once the key areas of definition were obtained, they were verified again with examples generated by ChatGPT's algorithm through a multilingual query (Table 5). The variety of examples indicated in the same languages allowed for clarification of the characteristics and scope of GC definitions and classifications. The use of such a loop made it possible to clarify the type of GC by identifying a new Level 2 criterion that was not included in the initial literature analysis. As a summary of the analyses carried out, the characteristics of GC definition were determined, pointing out its inclusive and exclusive elements from two perspectives: factual and attributive (Table 6).

**Stage 4.** The goal of this stage was to **formulate the definition and classification of GC**. In the process of creating the theoretical concept, including formulating definitions and developing classifications, a flexible pattern matching approach was used (Bouncken et al. 2021). The use of flexible pattern matching made it possible to detail the identified general criteria and consider the logical connection of the levels and criteria determined in the analysis that characterize the GC phenomenon. After analyzing the results from stage 3 the structure was effectively understood, and the categories which provide a structure for generalizing the results and building elements of the theory were determined.

## 3. Findings

### 3.1. Identifying the meaning of the term “Game changer”

Analyzing the texts extracted from the Google Scholar database, according to the methodology adopted for stage 1, the following results were obtained (Table 1).

Preliminary findings from the scoping review show that the authors of the reviewed papers do not define the term GC specifically. Its understanding in the literature is intuitive [Inoue et al., 2014]. In 7 out of 10 papers analyzed, the phrase “game changer” appeared no more than twice, usually in the title, abstract, or conclusions. An analysis of the complete texts shows that GC is identified contextually, in relation to the subject matter discussed in the analyzed paper. For example, technology solutions are identified as GCs in the financial industry [LeBlanc, Chaput, 2017] and forensic science [van Baar et al., 2014]. Similarly, the Pokemon Go game is seen as a GC for its potential to reduce the problem of insufficient physical activity. The area of impact presented this way relates to the specific area that the GC influences and shapes.

Another dimension that characterizes the GCs analyzed in Table 1 is the extent of impact related to the power of influence. The analysis shows that the impact of a GC is often directly attributed to its specific area of application, such as treatment of TB [Evans, 2011], cancer radiotherapy [Jarosz-Biej et al., 2019; Inoue et al., 2014]. However, there are also papers that present a more global approach to GCs, such as the use of big-data in business, scientific, and social decision-making [Patgiri, 2016], or the global impact of climate change on all spheres of life on earth [Al-Maamary et al., 2017]. This different view of GCs involves assessment of the area of GC impact, which can be either more global or local. Detailed criteria for assessing the power and extent of such influence require further study.

Initial attempts to identify the concept of a GC (determine what it is) based on the analyzed texts indicate a variety of types of phenomena that are referred to as game changers. In the sample of analyzed papers, examples of GCs include new technology [Inoue et al., 2014], climate change [Al-Maamary et al., 2017], a new behavioral model [De Vaan et al., 2015], a new diagnostic tool [Evans, 2011], and the introduction of a new remote service [van Baaret et al., 2019]. The common feature of the GCs analyzed was their appearance as novelties within their respective environments. However, due to the diverse nature of these GCs, it is challenging to determine which specific phenomena should be included in the GC definition. The examples suggest that GCs may be grouped into categories, but determining which groups of phenomena are constantly presented as GCs in the literature requires further analysis.



Table 1. List of analyzed articles from the Google Scholar database (as of February 23, 2023)

No/Article/Citations	Game changer (GC)	
	Occurrence	Definition/context
1. Jarosz-Biej, M., Smolarczyk, R., Cichoń, T., Kułach, N. [2019], Tumor microenvironment as a “game changer” in cancer radiotherapy, <i>International journal of molecular sciences</i> 20(13): 3212/citing226	4	Identifying an essential element of "tumor microenvironment," understanding which may be a key element in cancer radiotherapy.
2. Inoue, H., Nagata, N., Kurokawa, H., Yamanaka, S. [2014], iPSC cells: a game changer for future medicine, <i>The EMBO journal</i> 33(5): 409–417/citing 425	2	New technology, cancer treatment tool “We believe that iPSCs can be game changer...”
3. Al-Maamary, H.M., Kazem, H.A., Chaichan, M.T. [2017], Climate change: the game changer in the Gulf Cooperation Council region, <i>Renewable and Sustainable Energy Reviews</i> 76: 555–576/citing 163	5	Climate change is a game changer with an unforeseen but specific global impact.
4. De Vaan, M., Stark, D., Vedres, B. [2015], Game changer: The topology of creativity, <i>American Journal of Sociology</i> 120(4): 1144–1194/citing 289	4	Creativity-based games. Identifying a new behavior model, changing the approach to social networks, and how people connect to generate new ideas and solutions.
5. Evans, C.A. [2011], GeneXpert – a game-changer for tuberculosis control?, <i>PLoS medicine</i> 8(7): e1001064/citing 218	1 (in title)	GeneXpert (GC) is a new diagnostic tool that enables a quick and accurate diagnosis of tuberculosis.
6. Patgiri, R., Ahmed, A. [2016], Big data: The v's of the game changer paradigm, in: <i>2016 IEEE 18th international conference on high performance computing and communications; (HPCC/SmartCity/DSS)</i> : 17–24/citing.131	1 (in title)	The game changer is the concept and practice of using large data sets (Big Data) as a tool for making business, scientific and social decisions.
7. Garcia-Sanz, M. [2019], Control Co-Design: an engineering game changer, <i>Advanced Control for Applications: Engineering and Industrial Systems</i> 1(1): e18/citing 79	1 (in title)	A game changer is an approach to designing control systems called "Control Co-Design" (CCD).
8. van Baar, R.B., van Beek, H.M., Van Eijk, E.J. [2014], Digital forensics as a service: A game changer, <i>Digital Investigation</i> 11: S54 – S62/citing122	1 (in title)	The game changer in forensic forensics is the introduction of digital forensics as a service (DFaaS), i.e., a service provided remotely by digital service providers
9. Hendershott, T., Zhang, X., Zhao, J.L., Zheng, Z. [2021], FinTech as a game changer: Overview of research frontiers, <i>Information Systems Research</i> 32(1): 1–17/citing 60	1 (in title)	FinTech is a factor that significantly changes the financial landscape and can be considered a "game changer" in the financial industry.
10. LeBlanc, A.G., Chaput, J.P. [2017], Pokémon Go: A game changer for the physical inactivity crisis?, <i>Preventive medicine</i> 101: 235–237/citing 222	2	The "game changer" of using the "Pokémon Go" Game is its potential ability to increase physical activity.

Source: own study based on the Google Scholar review, entry “game changer” (accessed February 25, 2023).

### 3.2. Identification of GCs based on papers available in the SCOPUS database

To identify GCs, papers found in the SCOPUS database were subjected to text analysis. As a result, 69 papers containing the phrase ‘GC’ in the title, abstract or keywords were selected from the SCOPUS database.

Table 2. Assignment of game changers according to the criteria of Level 1 and 2 (N=69)

Level/ criteria	Source	Number of articles
1. Game changer type	1. Technology Azzutti [2022]; Ravinagarajan, Sophia [2022]; Uzun [2020]; Kushwaha et al. [2018]; Rana et al. [2021]; Krishnan [2013]; Krausova, Moravec [2022]; Lock [2019]; Barcelo et al. [2022]; Kim, Na [2016]; Chaccour et al. [2022]; Uzun [2020]; Gupta et al. [2021]; Horst [2011]; Bavassano et al. [2000]; Zhou et al. [2020]; Richards, Stedmon [2017]; Roriz [2021]; Rakkolainen et al. [2009]; Oberti et al. [2022]; Manocha et al. [2023].	21
	2. Method Harrer-Amersdorffer, Lehmann [2021]; Zwartkruis, de Jong [2020]; Simon [2016]; Garcia-Sanz [2019]; Speaker et al. [2022]; Coskun et al. [2012]; Kumbhar [2017]; Foss, Jenson [2011]; Elkatatny [2020]; Koch et al. [2022]; Napolitano et al. [2022]; Kist et al. [2022]; Akanbi et al. [2017]; Hendrieckx et al. [2017]; Kassem et al. [2020]; Muñiz et al. [2021]; Sarang, Viswanathan [2016]; Kumar et al. [2020]; Caporossi et al. [2022]; Nebeker [2020]; Navas et al. [2021]; Ilgun, Schmickl [2022]; Rahman et al. [2017]; Zhang, Lam [2015]; Iskandar, Lang [2017].	25
	3. Concept Muthu et al. [2021]; Goffaux et al. [2022]; Mitu et al. [2022]; Bila et al. [2022]; Zaidi [2016]; Wright et al. [2021]; Churchman [2018]; Tinetti et al. [2015]; Lorenzo [2021]; Rosenberg [2013]; Meffert et al. [2021]; Harouaka [2014]; Sinha et al. [2020]; Pessis [2016]; Bjärstig et al. [2019].	15
	4. Phenomenon Barclay [2012]; Loorbach et al. [2016]; Sager-Klauss [2016]; Ansell et al. [2021]; Oliva, Favato [2022]; Anil [2019]; Krasilnikova, Favin-Keitel [2022]; Merkert, Morrell [2012].	8
2. Influence area	1. Economy Azzutti [2022]; Ravinagarajan, Sophia [2022]; Zwartkruis, de Jong [2020]; Uzun [2020]; Gupta et al. [2021]; Horst [2011]; Bavassano et al. [2000]; Garcia-Sanz [2019]; Richards, Stedmon [2017]; Roriz [2021]; Coskun et al. [2012]; Rakkolainen et al. [2009]; Kumbhar [2017]; Foss, Jenson [2011]; Elkatatny [2020]; Navas et al. [2021]; Harouaka [2014]; Rahman et al. [2017]; Zhang, Lam [2015]; Merkert, Morrell [2012].	20
	2. Social Barclay [2012]; Harrer-Amersdorffer, Lehmann [2021]; Krausova, Moravec [2022]; Speaker et al. [2022]; Oberti et al. [2022]; Muthu et al. [2021]; Koch et al. [2022]; Napolitano et al. [2022]; Manocha et al. [2023]; Goffaux et al. [2022]; Mitu et al. [2022]; Bila et al. [2022]; Kist et al. [2022]; Akanbi et al. [2017]; Zaidi [2016]; Wright et al. [2021]; Hendrieckx et al. [2017]; Kassem et al. [2020]; Muñiz et al. [2021]; Sarang, Viswanathan [2016]; Kumar et al. [2020]; Caporossi et al. [2022]; Nebeker [2020]; Churchman [2018]; Tinetti et al. [2015]; Rosenberg [2013]; Ilgun, Schmickl [2022]; Meffert et al. [2021]; Anil [2019]; Krasilnikova, Favin-Keitel [2022]; Sinha et al. [2020]; Iskandar, Lang [2017]; Bjärstig et al. [2019].	33
	3. Economic and social Uzun [2020]; Kushwaha et al. [2018]; Rana at al. [2021]; Krishnan [2013]; Lock [2019]; Barcelo et al. [2022]; Kim, Na [2016]; Chaccour et al. [2022]; Zhou et al. [2020]; Simon [2016]; Lorenzo [2021]; Loorbach et al. [2016]; Sager-Klauss [2016]; Ansell et al. [2021]; Oliva, Favato [2022]; Pessis [2016].	16

Level/ criteria	Source	Number of articles
3. Power Impact	1. Macro Barclay [2012]; Uzun [2020]; Kushwaha et al. [2018]; Rana et al. [2021]; Krishnan [2013]; Krausova, Moravec [2022]; Lock [2019]; Barcelo et al. [2022]; Kim, Na [2016]; Chaccour et al. [2022]; Gupta et al. [2021]; Horst [2011]; Bavassano et al. [2000]; Loorbach et al. [2016]; Ansell et al. [2021]; Oliva, Favato [2022]; Anil [2019]; Krasilnikova, Favin-Keitel [2022].	18
	2. Meso Azzutti [2022]; Ravinagarajan, Sophia [2022]; Zhou et al. [2020]; Simon [2016]; Muthu et al. [2021]; Koch et al. [2022]; Napolitano et al. [2022]; Manocha et al. [2023]; Lorenzo [2021]; Navas et al. [2021]; Sager-Klauss [2016]; Haruoka [2014]; Sinha et al. [2020]; Merkert, Morrell [2012].	14
	3. Micro Harrer-Amersdorffer, Lehmann [2021]; Zwartkruis, de Jong [2020]; Uzun [2020]; Garcia-Sanz [2019]; Richards, Stedmon [2017]; Roriz [2021]; Speaker et al. [2022]; Coskun et al. [2012]; Rakkolainen et al. [2009]; Kumbhar [2017]; Foss, Jenson [2011]; Elkattatny [2020]; Oberti et al. [2022]; Goffaux et al. [2022]; Mitu et al. [2022]; Bila et al. [2022]; Kist et al. [2022]; Akanbi et al. [2017]; Zaidi [2016]; Wright et al. [2021]; Hendrieckx et al. [2017]; Kassem et al. [2020]; Muñiz et al. [2021]; Sarang, Viswanathan [2016]; Kumar et al. [2020]; Caporossi et al. [2022]; Nebeker [2020]; Churchman [2018]; Tinetti et al. [2015]; Rosenberg [2013]; Ilgun, Schmickl [2022]; Meffert et al. [2021]; Rahman et al. [2017]; Zhang, Lam [2015]; Pessis [2016]; Iskandar, Lang [2017]; Bjärstig et al. [2019].	37

Source: own study.

In none of the 69 papers analyzed did a definition or explanation of the term ‘game changer’ appeared. Each paper described one GC. The GCs described were heterogeneous, as the following phenomena were deemed as GCs: new technological solutions (in 21 papers), new methods/processes of operation (in 25 papers), new concepts/ideas (in 15 papers), or new phenomena (in 7 papers). The evidence is in table 2.

The GCs identified in the papers showed an impact primarily on the social sphere (33 papers) and, to a lesser extent, on the economic sphere (20 papers). Only 16 papers pointed to the impact of GC on both spheres simultaneously. In each sphere, the GCs discussed concerned either new technology, new methods, new concepts/ideas, or new phenomena. However, it is worth noting that the economic sphere was mostly affected by GCs related to new technology (described in 9 papers) and new methods (described in 9 papers). Other GCs affecting the economic sphere include: 1 GC in the form of a new concept and 1 GC in the form of a new phenomenon. The social sphere was mostly affected by GCs related to new methods (described in 15 papers) and new concepts/ideas (described in 11 papers). Other GCs affecting the social sphere were related to new phenomena (described in 4 papers) and new technology (described in 3 papers).

In addition, the GCs described differed in their territorial and industry impact. The GCs with local/micro impact (described in as many as 38 papers) were by far the most prevalent. GCs of macro/global scope were identified in 18 papers, and of meso/regional scope in 14 papers.

The most frequently identified technological GCs with macro/global impact included the development of artificial intelligence [Krausova, Moravec, 2022; Uzun, 2020; Kist et al., 2022; Elkatatny, 2020] and the development of IT tools to process large data sets in real time, including big data and blockchain technologies [Ravinagarajan, Sophia, 2022; Kushwaha et al., 2018; Krishnan, 2013; Barcelo, Queralt, Cortes, 2022; Kim, Na, 2016; Bavassano, Ferrari, Tei, 2020]. Micro/local technological GCs discussed in a small number of papers were technologies with a very narrow application in a particular sub-discipline or sub-sector, such as those applicable in the conservation industry [Speaker et al., 2022] or in telescopes [Oberti et al., 2022]. The use of artificial intelligence in the financial market [Azzutti, 2022] can be an example of technological GC with meso impact.

The impact of GCs related to new methods was determined by their level of universality. Examples of GCs concerning universal methods include: a new way of administering knowledge to students [Harrer-Amersdorffer, Lehmann, 2021], a new way of conducting qualitative research [Hendrieckx et al., 2017], a new method of stem cell treatment [Kassem, Kamal, 2020], or a new way of warfare [Rahman, 2017]. Examples of methods focused on a single application and also considered GCs include the introduction of a new method for designing and creating bee hives based on HIVEOPOLIS mycelium [Ilgun, Schmickl, 2022], a new technique for treating macular degeneration in the eye [Caporossi et al., 2022], or a new method of selection of psychotropic drugs [Muñiz et al., 2021]. An example of a GC in the form of a new method with meso impact is the new method of stem cell storage used for genetic research [Koch et al., 2022].

In the analyzed papers, new concepts and ideas are also labeled as GCs. Some of them had broad applications, and some clearly narrow. The former include, among others, the introduction of a new organizational solution in the form of public-private partnerships [Sinha, 2020], or the emergence of the idea of CSR that changed the rules of business operation [Anil et al., 2019]. GCs in the form of meso-scale concepts/ideas include, for example, the introduction of the new concept of legal cross-border interest [Lorenzo, 2021]. On the other hand, GCs in the form of concepts/ ideas with narrow application can include the use of a scientific concept – psychological property – in dental education [Muthu et al., 2021], or clarification of the concept of “great points” in tennis as a breakthrough in the evaluation of the game [Meffert et al., 2021].

The last category identified from SCOPUS papers was GCs related to new phenomena. As in the case of technologies, methods, and concepts, the scope of the impact of these phenomena varied. The COVID-19 pandemic [Ansell, Sørensen, Torfing, 2021], Generation Y [Barclay, 2012], the economic crisis [Loorbach et al., 2016], or teleworking [Krasilnikova, Levin-Keitel, 2022] can be classified as game-changing phenomena with global impact. On the other hand, the development of small and

medium-sized energy communities [Sager-Klauss, 2016] can be an example of a meso-level GC. Interestingly, at this level, no micro impact GC was identified in the papers analyzed.

It should be noted that the GCs described almost always had the assumed impact, significantly changing the existing rules of the game. The exception was one paper in which the described GC (a new Delta variant of the Covid virus) did not change the existing rules of conduct [Oliva, Favato, 2022]. The described impact was almost always positive. Only one paper pointed out the negative impact of the identified GC [Uzun, 2020].

The qualitative analyses prepared make us aware of the variety of GCs indicated in the literature. To test their universality, we undertook qualitative analyses of the collected n=69 texts from the perspective of the subject areas assigned to them. The purpose of such an analysis was to answer the question of whether the nature of the GCs identified was universal, i.e., constant and independent of the discipline in which it was identified.

The papers analyzed were mostly assigned to more than one subject area in the SCOPUS database, resulting in 127 analyses being conducted. The largest number of papers including the keyword “GC” were assigned to the subject area: “engineering” (16 texts), “social sciences” (16), “medicine” (14), “computer science” (12) and “business, management and accounting” (11). Only 40 texts were assigned to a single subject area. The remaining 87 papers were assigned to several subject areas, with 37 papers were assigned to 2 areas, 30 papers assigned to 3 areas, and 7 papers assigned to as many as 6 areas. A breakdown of the number of papers mentioning GCs assigned to each subject area is presented in Table 3.

Table 3. List of articles on “GC” in the SCOPUS database, broken down by thematic areas

	Subject area name	Number of articles	Number areas assignment:					
			=1	=2	=3	=4	=5	=6
1	Engineering	16	3	6	5	1	1	0
2	Social Sciences	16	7	3	5	1	0	0
3	Medicine	14	9	3	1	0	0	1
4	Computer Science	12	1	6	3	1	1	0
5	Business, Management and Accounting	11	3	3	4	1	0	0
6	Biochemistry, Genetics and Molecular Biology	7	2	2	1	0	1	1
7	Physics and Astronomy	6	1	3	1	0	1	0
8	Environmental Science	5	3	1	1	0	0	0
9	Health Professions	5	3	0	1	0	0	1
10	Agricultural and Biological Sciences	4	3	1	0	0	0	0
11	Decision Sciences	3	1	0	1	1	0	0

cont. Table 3

	Subject area name	Number of articles	Number areas assignment:					
			=1	=2	=3	=4	=5	=6
12	Earth and Planetary Sciences	3	0	0	3	0	0	0
13	Energy	3	0	1	1	1	0	0
14	Materials Science	3	1	0	2	0	0	0
15	Arts and Humanities	2	0	1	1	0	0	0
16	Chemical Engineering	2	0	1	0	0	1	0
17	Chemistry	2	0	1	0	0	0	1
18	Economics, Econometrics and Finance	2	0	1	0	1	0	0
19	Nursing	2	1	1	0	0	0	0
20	Pharmacology, Toxicology and Pharmaceutics	2	0	1	0	0	0	1
21	Psychology	2	0	2	0	0	0	0
22	Dentistry	1	1	0	0	0	0	0
23	Immunology and Microbiology	1	0	0	0	0	0	1
24	Mathematics	1	0	0	0	1	0	0
25	Multidisciplinary	1	1	0	0	0	0	0
26	Neuroscience	1	0	0	0	0	0	1
	Total	127	40	37	30	8	5	7

Source: own study.

The fact that an article was assigned to more than one subject area did not affect the type of GC identified/described in the text, its scope of impact, and its sphere of influence. Regardless of whether a paper was assigned to one or many subject areas, it contained a description of one GC. Therefore, it can be considered that the characteristics adopted to describe a GC regarding its type, scope of impact, and sphere of influence were universal, regardless of the subject area/field into which the paper describing the GC was classified.

### 3.3. Structuring of GC definitions

To understand what a GC really is and how it can be generally defined, new AI chat technologies GPT-3.5 and GPT-4.0 were used for analysis. The generated definitions initiated a question/prompt that took into account the characteristics established by us, such as type, scope of impact and range of influence. ChatGPT was asked to generate both a short and a long version of the definition. The purpose of this was to acquire a variety of terms and their collocations generated by the algorithm from a large database, and presented in a natural language structure.

Our analysis of GPT-generated content addressed four elements that were considered crucial in formulating the definitions: E1) the factual context in which the GC is analyzed, identified with the question, “What is called the GC?”; E2) attributes or

characteristic features that identify the GC and are the key features of its recognizability, the question: “What characterizes the GC?”; E3) additional inclusive or exclusive elements that complement the characteristics of the GC, the question: “What proves the uniqueness of the game changer?”; E4) the result of GC’s impact, the question: “What effect does the GC have?”. The areas were refined after the analyses conducted in stage 2, in particular, after the Level 1 and Level 2 criteria were established.

To complete the definition of GC and find the differences between GC and non-GC, ChatGPT was also asked to define non-GC following the same procedure used for defining GC. Performing a qualitative analysis of the text, a grouping of similar elements was carried out, assigning them to specific areas of definition (Table 4).

Table 4. Key elements of the definition of “game changer”

	Identification questions	Key elements of definition
E1	1. What is called GC?	Technology, method, idea, phenomenon, gadget, event, discovery, innovation, change, change agent.
	2. What is called non-GC?	Concept, phenomenon, technology idea, change, improvement, method.
E2	1. What is characteristic of GC?	Groundbreaking, innovative, unique, significant, revolutionary new, transformative, big, disruptive.
	2. What is characteristic of non-GC?	Improvement, non-revolutionary, little progress.
E3	What proves the uniqueness of GC?	Disrupts existing practices, significantly changes the existing paradigm, has a profound impact, fresh approach, impact of social norm, impact of economic health, impact of socio-economic structure, completely changes the scale of impact, redefines existing models, paves the way for a new way of doing or understanding, can apply to anything, from a single person to the whole world, breaks old patterns, opens up new opportunities, leading to significant advances.
	2. What proves the uniqueness of non-GC?	No transformational change, no recognition as groundbreaking, not changing the market (industry, rules of the game).
E4	1. Impact result: what effect does GC have?	A new era, a new stage of development.
	2. Impact result: what effect does non-GC have?	Continuation of the existing rules, slight improvement of some parameters without affecting the revolutionary changes.

Source: own study.

The next loop of GC definition refinement was qualitative analysis of content similarity of the game changer definitions generated by ChatGPT in Chinese (Ch), Spanish (Sp), English (E), Polish (P), and Slovenian (S) (Table 5). Analysis of these definitions, which we treated as expert because ChatGPT used its database to formulate them, showed that GC in all these languages was defined similarly. Language is irrelevant to the analysis conducted, as in the research of Ciappelloni et al. [2023].

Table 5. “Game changer” meaning and example by GPTChat – different language perspective

Game changer meaning	
Foreign language question/English meaning	Examples
<p>Chinese Question: "game changer" 是什么意思?                      Game changer is an English idiom, which refers to an event or a person that significantly changes the status quo or alters the dynamics of a certain industry or field. The term is typically used to describe a new technology, strategy, idea, or individual that can change the course of things in ways previously thought impossible. It can be used in various fields such as business, politics, and culture.</p>	<p>For example, Apple's iPhone is a game changer, it changed the way people use mobile phones after its launch in the smartphone market, bringing about a revolution in the mobile internet.                      In the world of sports, some players are considered game changers because of their skills and performances that break the traditional rules of the court.</p>
<p>Spanish/Question: <i>¿Qué significa "game changer"?</i>                      A "Game changer" is an English expression used to describe something or someone who significantly changes the rules of the game or the dynamics of a situation. It may refer to an event, a technology, an idea or a person that alters the outcome of a game, an industry, or any activity in an important way and usually unexpected.</p>	<p>For example, if a new product or service revolutionizes an industry, we can say it is a "game changer". In the same way, a technologic innovation that radically transforms the way some tasks are performed can also be considered a "game changer". To conclude, a "game changer" is something that changes the rules of the game in an important and shocking way.</p>
<p>English/Question: <i>What does "game changer" mean?</i>                      Answer: "Game changer" is a term used to describe something or someone that significantly alters the way things are done, usually in a particular field or industry. It often refers to an innovation, strategy, technology, or person that has a significant impact on the status quo and can shift the direction or outcome of a situation.</p>	<p>In sports, for example, a game changer is a player who has the ability to turn the tide of a game, often by making a critical play or decision. In business, a game changer could refer to a company that introduces a new product or service that revolutionizes the industry or disrupts the market. In technology, a game changer could refer to a new invention or breakthrough that fundamentally changes the way people interact with technology.</p>
<p>Polish/Question: <i>Co to znaczy "game changer"?</i>                      Answer: It can be a new, innovative technology that changes the way a product is made or used, a revolutionary concept or idea that changes the way people think or approach a given field, or even a person or team that introduces new standards and methods of work, thereby changing the way things are done in a given industry.</p>	<p>The Internet has changed the way we connect and use information. Electric cars have changed the way we travel and affect the environment. Steve Jobs led a revolution in the field of personal computers and mobile devices. Lionel Messi changed how football is understood and played around the world.</p>
<p>Slovenian /Question <i>Kaj pomeni "game changer"?</i>                      The phrase "game changer" means something that has a very significant impact on a particular situation, turning it upside down and fundamentally altering the course of events. It represents a turning point and can significantly change the way an area or situation is perceived, thought about, or operates.</p>	<p>The term is often used in sports, business, politics, and other fields when changes occur that have a major impact on the current state.</p>

Resource: own study.

Analyzing Table 5, it was found that the term “game changer” was deemed as an idiom (Ch), expression (Sp), or term (E), which for our consideration has the same meaning. In all definitions, elements such as “something” or “someone” appear. The examples indicate specific events (Ch, Sp), technology (Ch, Sp, strategy (Ch, Sp, E),



ideas (Ch, Sp, P), concept (P) or new element such as person, team (P) and people (Ch, Sp, E, P). These elements are characterized by specific features such as innovation (P), novelty (CH), a strong impact on environment change (Ch, Sp, E, P, S), and influencing the perception of reality by others (S). It is the cause of change (Ch, Sp, E, P, S), the cause of new perception of reality (Ch, S, Sp), and it introduces new standards (P). The reference under which GCs were identified was industry (Ch, Sp, E, P), a given field (Ch, E, P), an activity (Sp), or a situation (P, S).

Depending on the type of language in which the question was asked, different examples of GCs were obtained. Most examples were generic and related to areas such as innovation technology (Sp, E) and new products that revolutionized industries (E). Two definitions pointed out specific examples: in Chinese, it was Apple's iPhone, and in Polish, it was the Internet, electric cars, Steve Jobs, and Lionel Messi (PERSON). In four deficits (Ch, E, P, S) the examples were related to sports and players (PEOPLE) whose skills and performance break traditional rules in football or on the court and were indicated as GCs. The variety of examples presented reinforced our belief that the expert definition of GC is complex and can be interpreted in different ways.

Analyzing Level 2 characteristics identified in Table 6 for the type category, it was noted that a new type of GC referred to as “person, team, people” appears in the linguistic definitions. This involves treating people like objects and seeing them as the perpetrators of concrete change. Importantly, a human being (person) appears in the generated definitions in various configurations. From the perspective of the SCOPUS database analyzed, it is noteworthy that only one analyzed text presented GCs as Generation Y as a game changer in the automotive market (Barclay, 2012). It was recognized in the coding process of Level 2 as a phenomenon, focusing on the specific characteristics of GCs (generational behavior change) rather than a type of GC. There was no GC type “people” in the analyzed papers.

The search for a unified definition of GC was related to the analysis of its key areas, which were eventually formulated as context in material (type of GC) and attributive (characteristics and uniqueness of GC) terms. These features were related to two key perspectives derived from the logic of defining what is a GC (inclusion components describing GC types and attributes) and defining what is not a GC (exclusion components) (Table 6).

The main direction of the search for key elements of the GC definition was to analyze and compare what distinguishes GCs from non-GCs. Analysis of Table 6 shows that the differentiating element between the two phenomena is the attributive perspective, which identifies GCs as “something” or “someone” with significant, epoch-making novelty introduced radically and revolutionarily. A non-GC, on the other hand, is identified as “something” or “someone” exhibiting adaptability complementary to the novelty aimed at introducing improvement in an evolutionary manner.

Table 6. Properties of the “Game changer” definition – the perspective of inclusive and exclusive elements in the material and attribute context

Attribute perspective (attribute)	<ul style="list-style-type: none"> <li>– Significant degree of novelty (epoch-making, pioneering)</li> <li>– Character of novelty – basic</li> <li>– Scope of influence – radical</li> <li>– Pace and intensity of change – revolutionary</li> </ul>	<ul style="list-style-type: none"> <li>– Adaptive degree of novelty</li> <li>– Nature of the novelty – supplementary</li> <li>– Scope of influence – modifying, improving</li> <li>– Pace and intensity of change – evolutionary</li> </ul>
Substantive perspective (kind)	"Something" or "Someone" Technology, Method, Phenomenon Concept, People	
	Inclusive determinants	Exclusive determinants

Source: own study.

## 4. Definition and classification of the game changer phenomenon

### 4.1. Game changer definition

Referring to the goal set at the beginning, which was to define the term “game changer”, and taking into account all the results of qualitative and expert analyses formulated by humans and generated by the computer, we have developed definitions of GCs. Using analogies of the deductive process and relevant research results, we also defined non-GCs.

**Full Game Changer Definition:** GC is a significant, epoch-making, technology, method, concept, or phenomenon that establishes a new stage or era of development on a micro, meso, or macro scope. It causes radical changes in the economic, social, or both economic and social area, identifiable at a specific time (identifiable), and develops in a revolutionary manner. A GC can also be a single person, a team of people who, through their skills, abilities, and creative action, have a revolutionary impact on the development of one or more spheres, industries, or regions. Thus understood, a GC can be considered in one of the approaches at the micro, meso, or macro levels.”

**Short Game Changer Definition:** A GC is a significant epoch-making novelty that establishes a new stage or era of development, causing radical changes in a particular area, at a particular time (identifiable) and developing in a revolutionary manner”.

**Full Non-Game Changer Definition:** A non-GC is an adaptive technology, method, concept, or phenomenon, which is not groundbreaking. It has a modifying and improving character and proceeds in an evolutionary way. A non-GC can also be a person or a team, who through their skills, abilities, and creative actions, do not have a revolutionary impact on development at the micro, meso, macro scale.

**Short Non-Game Changer Definition:** A non-GC is an adaptive innovation that is not groundbreaking, modifying and improving in nature, and proceeds in an evolutionary manner.

## 4.2. Game changer classification

Using the results of our research related to the establishment of Level 1 and Level 2 criteria diagnosed on the basis of the adopted research methodology, we developed a classification of GCs that takes into account the results of literature analysis and qualitative analysis of definitions generated by ChatGPT. The characteristics of each criterion, along with the distinguishing and differentiating features, are shown in Table 7.

Table 7. Game Changer classification description by criterion level 1 and 2

Criterion	Descriptive definition	Distinguishing features of a given criterion	Characteristics that distinguish data from others
1. GAME CHANGER TYPE	Unambiguous assignment of a GC to a specific group, taking into account its specific characteristics	GC characteristics as a criterion for assignment to type defined	Nature of the type under analysis or its detailed characteristics
1.1 Technology	A collection of tools, device techniques, or apps about new devices	Something new that is identified by certain attributes specific to its type	Characteristics of individual cases
1.2 Method	Procedure for working on something: a set of steps, rules, guidelines, and abstract concepts that can be used in action		
1.3 Concept/idea	An attitude towards something: a worldview, thought, or idea.		
1.4 Phenomenon	An event that can be observed and perceived by the senses		
1.5 Human	A group, a team, or a single person with special skills, knowledge, and driving force		
2. INFLUENCE AREA	The area and nature of GC impact and the type of consequences caused	Impact on something, with its consequences in a particular area, resulting in specific values	Scope or scale of changes in the impact area and level of universality
2.1 Economic	Economic impacts with economic consequences	Qualitative change of a specific sphere of influence, identification of that specific sphere of influence	Connection with a specific sphere of life where there are changes in principles, rules, and conditions for the functioning of people and organizations
2.2 Social	Social impact causing social consequences		
2.3 Socio-economic	Impact of both economic and social nature, causing consequences in both spheres		

Criterion	Descriptive definition	Distinguishing features of a given criterion	Characteristics that distinguish data from others
3. <i>POWER IMPACT</i>	Territorial and industry range of impact and the level of universality of GC	Changes caused in a specific area, e.g., territorial, industry scope	The scale of the introduced changes
3.1 Makro	Global territorial and industry impact	Determination of the impact range	A change related to the range of impact, relating to a specific area, e.g., territorial, industry
3.2 Meso	Regional industry impact refers to a specific target group that is larger than an individual or local and smaller than global		
3.3 Micro	Local territorial and industry impact		

## Conclusion

“Game changer” is a concept that is gaining popularity in many fields of science today. It is the cause of changes of a certain type, in a certain place, with a certain force. The fact that many researchers use it without defining its meaning makes it enigmatic. To address this, a definition of GC was developed and presented in two versions in this paper. The full definition presents not only the main identifying features of the phenomenon but also includes criteria for its differentiation on two levels. The short definition focuses on the essence of what a GC is by pointing to a significant epoch-making innovation establishing a new stage or new era of development. Similarly, a definition of non-GC was formulated in opposition to GC, emphasizing those features that distinguish GCs from non-GCs.

The multi-level analyses conducted according to the methodology adopting the strategy of grounded theory made it possible to identify the key criteria for differentiating GCs, which at the first level of generality are: **game changer type** defining the nature of the change, detailed into four areas such as technology, method, concept, phenomenon, and human; **influence area** indicating the area of impact, which can be economic, social, or both economic and social, and **power impact** determining the scope, identified in three perspectives: micro, meso, and macro.

The methodological originality of the process of formulating the definition should also be emphasized. Adopting a research strategy based on grounded theory, related to theoretical sampling and multiple comparisons to achieve theoretical saturation, has identified key criteria important to our definition and classification of GCs. Combining database analysis techniques with traditional hand coding, inspired by the literature review model used by Sarte et al. [2020], made it possible to unveil the logic behind linking research streams, providing both the ability to integrate and identify sources

of conceptual ambiguity [Hannigan et al., 2019; McMahan, Evans, 2018]. Another innovation in our methodology is the inclusion of ChatGPT based on algorithms used in machine learning as experts in the analysis. The process implemented by us, in which we use mixed methods to achieve the defined goal, can inspire other authors taking on the challenges of literature review and analysis.

Our theoretical contribution related to the development of the definition of GC and its classification, in which we defined the key criteria for its distinction, is to facilitate understanding of the new phenomenon, in the context of the type, impact, and strength of contemporary changes in the environment. It seems particularly important to distinguish between GC phenomena that significantly change our reality- those that are epoch-making and revolutionary – and non-GCs, which are phenomena that help change our world in an evolutionary way within a certain scale and area.

Our considerations highlight the role of the change recognition stage, which is the starting point not only in the decision-making process but also in the concept of organizational adaptation or change management theory. Our definition and classification, can be used to diagnose the nature of the changes to which the organization must adapt. The definition of a GC is crucial to the proper adaptation process of an organization. The absence of such mechanisms was pointed out by Sarta et al. [2021] as a factor hindering the development of knowledge in the area of organizational adaptation.

From the perspective of management science, particularly strategic management, our analyses highlight the process of identifying change from the perspective of diagnosing its characteristics, the recognition of which will allow us to better understand the environmental turbulence. Knowledge of the nature of changes in the environment that managers should have makes it easier for them to take decisions related to adaptation activities, and to determine how important the identified change is for a given organization. The topic discussed and the arguments presented in the paper build awareness of the search for knowledge about the changes around us, their nature and, above all, the extent and power of their influence.

The presented definition and classification of game changers in practice will allow managers to understand the changes in the environment better and better prepare adaptation activities. Recognizing the nature of the causes of environmental changes and assessing them based on our proposed classification in the micro, meso, and macro dimensions should be considered when making strategic, tactical, or operational adaptation decisions.

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## GAME CHANGER – DEFINITION AND CLASSIFICATION: A HUMAN AND CHATGPT VIEW

### Abstract

The world in which organizations operate is changing, and researchers are increasingly trying to determine not only the effects or adaptability to change but also to identify its causes. To better understand what changes our reality, we have developed the definitions and main features of a game changer to describe and characterize it. We used different methods in our research, using a grounded theory strategy combining analyses in a human-computer model. This combination involved both thematic modeling with different level of systematicity and systematic manual coding of manuscripts. As a novelty, we introduced ChatGPT, which

enabled deepening our syntheses, complementing and generalizing the results. Defining what is and what is not a game changer will enable better recognition of the causes of change, which is the starting point not only in decision-making, but also in the concept of organizational adaptation or change management theory.

**KEYWORDS: GAME CHANGER, ORGANIZATION, ENVIRONMENTAL UNCERTAINTY, CHATGPT, BUSINESS MODELS, CHANGE MANAGEMENT, SUSTAINABLE DEVELOPMENT**

**JEL CLASSIFICATION CODES: Q5, M00, D21, C80, I10**

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## **GRA ZMIENIAJĄCA ZASADY – DEFINICJA I KLASYFIKACJA: WIDOK CZŁOWIEKA I CHATGPT**

### **Streszczenie**

Świat, w którym funkcjonują organizacje, zmienia się, a badacze coraz częściej starają się nie tylko określić skutki czy możliwości adaptacji do zmian, ale także zidentyfikować ich przyczyny. Aby lepiej zrozumieć, co zmienia naszą rzeczywistość, autorzy artykułu opracowali definicje i główne cechy pojęcia „game changer”. Celem artykułu jest zdefiniowanie terminu „game changer” i opracowanie klasyfikacji wskazującej kryteria różnicowania, które umożliwią jego lepszy opis. W badaniach zastosowano różne metody, wykorzystując strategię teorii ugruntowanej, łączącej analizy w modelu człowiek – komputer. Połączenie to obejmowało zarówno modelowanie tematyczne o różnym poziomie systematyczności, jak i ręczne, systematyczne kodowanie abstraktów. Jako nowość dodatkowo posłużono się narzędziem ChatGPT, co pomogło nam sprawniej przeprowadzić syntezy oraz uzupełnić i uogólnić wyniki. Efektem postępowania badawczego było określenie, co jest, a co nie jest game changerem. Powyższe działania umożliwiają lepsze rozpoznanie przyczyn zmiany. Jest to ważne dla efektywniejszych procesów decyzyjnych, ale także dla rozwoju koncepcji adaptacji organizacyjnej czy teorii zarządzania zmianą.

**SŁOWA KLUCZOWE: GAME CHANGER, ORGANIZACJA, NIEPEWNOŚĆ OTOCZENIA, CHATGPT, MODELE BIZNESOWE, ZARZĄDZANIE ZMIANĄ, ZRÓWNOWAŻONY ROZWÓJ**

**KODY KLASYFIKACJI JEL: Q5, M00, D21, C80, I10**

