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Original article

Agile crisis management

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INFORMATIONS

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ABSTRACT

The article deals with crisis management. A new approach based on the agile methodologies of project management is proposed. The paper presents consecutively: crisis and its management (literature overview), characterisation of IT projects, agile project management, comparative analysis of agile approach and crisis management, proposal of a new idea – agile crisis management and conclusions. The conclusions emphasise the importance of following up with necessary empirical investigations.

KEYWORDS

IT project, crisis, management, Scrum

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Introduction

An attempt has been made to propose a new approach to crisis management. The point of departure is an agile approach – relatively recent, but already commonly applied in IT project management. Taking into account significant similarities between crisis and IT projects, there are opportunities for agile approach to become a very effective methodology used to manage and achieve recovery from a crisis situation. The main objectives are creating an interest about the possibilities of using agile approach to manage not only IT projects, but also to invite crisis management specialists to develop and apply it.

1. Crisis

1.1. Definitions

In the literature we find different definitions of crisis, depending on such factors as: domain of activity affected by crisis, type of crisis, its scale, resulting damage, point of view or experience of the author. Crisis is considered as “an abnormal situation, usually resulting from an instability that impacts a part of society with unacceptable consequences” [1]. This situation could be characterized by “a loss of control and thus a high

level of stress for the stakeholders involved, causing a disruption of the balance of a system (for example an organization, an infrastructure, a territory, etc.)" [2].

Crisis can be seen as "unusual situation" [3] and may be used to "describe the urgency for response due to a specific incident or a simple change in certain facts. More often, the word crisis refers to man-made incidents and the term disaster is used to describe natural phenomena" [4].

1.2. Features

Features common used to describe crisis, directly resulting from definitions above, are: abnormal/unusual situation, instability, loss of control, specificity, changes, serious consequences, disruption of the balance, disaster. Moreover, there are also others such as: increasing citizen participation [1], stakeholders making decisions under stress, experience improvement, engagement and realism, quick decision-making in critical conditions, complexity of information [2], engagement of security forces [4], early warning, external and internal influences [3], total disruptive event, panic inside the organisation, lack of morale, misinformation, loss of knowledge, loss of leadership, cancelling recruitments, loss of reputation [5], instability and discontinuity [6].

Summarising, in any crisis we are confronted with an unusual phenomenon, partially recognised, blurrily and incompletely defined, only partially predictable, possibly leading to a disaster, and very little time to find an adequate response.

1.3. Management

This section presents a short overview of the classic knowledge and approaches to crisis management. According to [5], "crisis management are organization's acts and behaviours which prepare it to be ready to manage major catastrophic happenings in a safe and effective style". Managing a crisis involves the participation of various stakeholders. The main phases are: mitigation, preparedness, response and recovery. Efficiency in managing a crisis is measured by the speed and precision with which information is managed and exchanged among partners. Successful crisis management requires full integration of all of the involved parties [1].

Crisis management involves quick decision-making in critical conditions. Crisis compels decision-makers to act in an urgent decision-making situation; their obligation is to minimise potential negative consequences. The human factor is frequently the main source of errors in the decision-making process. Decision-making, communication, leadership and coordination are critical skills to be used in crisis management. Difficulties of management in emergency situations, problems of shared mental representations of an unknown problem, and behaviour failures are the main sources of stakeholders' vulnerability in decision-making groups [2].

In the literature are some measurement and structural models of crisis management, formal frameworks describing it, with a software basis dedicated to formal information flow management in crisis context [4; 6]. Business crisis management is a system which tries to summarise the law of crisis occurrence and development, avoid and reduce the

harm of the crisis, crisis warning, crisis decision-making and crisis handling. The main part of crisis management consists in crisis monitoring. Many signs of crisis appear before the crisis [3].

Summarising, it can be stated that all approaches to crisis management emphasise such components as: human factor, stakeholders' involvement, crisis anticipation, decision-making in circumstances of lack of time and information, possible catastrophic consequences, necessary factors: communication, shared mentality, leadership and coordination.

A project and a crisis are related to each other in two ways. The first one consists in the fact that each project is exposed to a crisis [7]. On the other hand, each crisis can be perceived as a project. This project has a specific objective (crisis recovery), time do achieve it (very short), resources which are always limited (people, information, technology, finances) and, finally, an extremely high level of risk of a disaster as a very probable result.

All statements above recommend treating a crisis as a fuzzy phenomenon (namely, impossible to be exactly defined, with rather qualitative then quantitative properties) so this situation is comparable with IT projects. Consequently, it needs agile management, which will be proposed in the next section.

2. Characteristic of IT projects

The current trends in management and focusing on client's individual needs resulted in a significant increase in interest in the project, which allowed to turn project management into a separate discipline [8, p. 140]. This results in the increase in managers' respect for project management [9] that has been observed in recent years, and the growth in recognition for the idea of project management in organizations.

Theoretical problems related to project management assume many definitions of a "project". The analysis of selected definitions shows that a project, above all, is "a set of ordered actions that are limited in time, performed in order to achieve a unique aim while limiting the resources assigned to the project at the same time" [9; 10; 11, p. 85-6]. Next, the concept of project management itself should also be considered here. Referring to the general concept of management, it can be claimed that project management is "a set of actions that include planning, organising, leading, motivating, and controlling project resources in order to achieve project objectives" [10; 12].

There are many project typologies in literature. The division can be based on field, size, origin, specific character, and other factors [13; 14]. In the case of dividing projects based on the field, we can name, among others, IT projects [13; 14], which are the main point of interest of the authors of this work.

An IT project should be understood as "an IT task aiming at creating, delivering, and implementing an IT product along with services that are related to such a task" [15, p. 133]. IT projects can be divided based on novelty level (new and supplementary projects) and area (software, hardware and complex projects) [16].

An IT project, unlike projects from many other disciplines, is characterized by non-material character of project end products. That is why the projects of this type are hard to execute and characterised by a high complexity level [17, p. 20-1]. What is more, in times of high product customisation and creating "tailor-made software" in IT project management, it is necessary to adapt to client's changing requirements in order to deliver a product that fully meets client's expectations. A response for this need for adaptation has been found in agile methods of software development.

3. Agile project management

In project management there are two main representations of this concept: *a classic one*, including PMBOK®Guide, PRINCE2, and ICB methods and *an agile one*, e.g. Scrum, EX, Crystal [18].

The classic methods of project management are built on a stage-based approach to executing a task in which product requirements are defined at the planning stage and are not modified later in the project. In this approach, it is assumed that the conditions of project team operations are stable, which affects prepared plans and schedules in the project. As a result, there is a strong focus on documenting actions, which becomes the main aspect of control in project execution [18].

In the case of agile (adaptive) methods, the main idea is best presented in *Manifesto for Agile Software Development* prepared by a group of developers in 2001 as a *credo* of agile development of software, which values [19]:

– "individuals and interactions over processes and tools,
– working software (product) over extensive documentation,
– customer collaboration over contract negotiation,
– responding to change over following a plan".

"People and interactions" means concentrating on people involved in the project and their engagement, as well as on creating a cooperation-friendly environment. It also entails focusing on motivating project team members, ensuring mutual trust, and allowing for freedom in the actions of individuals involved in project execution. This postulate is confronted with "processes and tools", where attention is paid to the way software is developed and to the tools that are used in this process. Using proper tools in the project is an important aspect in the success of a project, but without knowledge and engagement of people who can use these tools it is not possible to achieve such a success [20, p. 60]. The next postulate, "working software", refers to developing software which is valuable from the client's perspective, provides benefits (e.g. financial ones) for the client, and ensures client's satisfaction by frequently publishing software that is ready for potential use. This is the centre of interest, valued over "comprehensive documentation", the concept of which focuses on providing complete project documentation. Agile methods also mean "customer cooperation", achieved by engaging the client in the project as a Product Owner. Cooperation is also valuable in Developer Teams within the project. This postulate is contrasted with "contract negotiation", understood as constant negotiation of cooperation conditions, both with the

client and between different teams in a given project. The last postulate, "responding to change", means constant focus on changes and reacting to them as well as treating change as an opportunity, not a threat. This concept ensures that the team is ready to implement changes even at later stages of software development. Adaptation becomes the centre of interest, as opposed to "following a plan", which means relying on assumptions and accepted procedures [19; 21-23]. The word "over" used in the Manifesto does not, however, mean that the concepts deemed classic have been given up completely. The authors of the Manifesto emphasize that "while there is value in the items on the right, [they] value the items on the left more" [19]. This Manifesto is then to complete the previously applied approach to software development in order to ensure that products delivered to the client will meet their requirements.

Adaptive methods focus on being open and reactive to changes in order to provide the client/sponsor with exactly what they want. The emphasis is on cooperation with the client throughout all project operations and not only at the first stages of the project. What is more, the execution of works is at the centre of attention, whereas the documentation is limited to the minimum and replaced with project meetings, during which the current action plan is established. The core element here is a self-organising team which independently makes all decisions regarding the way of operating, taking into account necessary adaptations for changing conditions of functioning. In such conditions, control can be limited and minimalised thanks to the operations based on engagement, cooperation, a sense of responsibility for the work performed and the product, as well as on mutual trust. Traditional reporting is replaced with a joint summary of iteration, based mostly on direct meetings of all team members providing room for reflection and consideration [18].

There are many agile approaches to software development. The most popular one among them is Scrum; research shows that over 56% agile practicing users report that they use this approach in project execution [24].

4. Proposal of crisis management

4.1. General frames

Following [7], we adopt the following positioning of crisis management. First, we admit that a crisis can occur at four levels: Business, Project Portfolio, Program and Project. At each level, we have three phases of crisis management: crisis prevention, crisis response, crisis recovery. The crisis management positioning follows the scheme shown in Figure 1.

Business and portfolio encompass a very large range of human activities. In both cases, the whole management effort is targeted at crisis prevention and focused on early plans of the continuity of activities, in spite of more of less predictable, disturbing phenomena. The real situation should be permanently monitored and the plans modified and adapted in order to maintain the (quasi) normal functioning of the system.

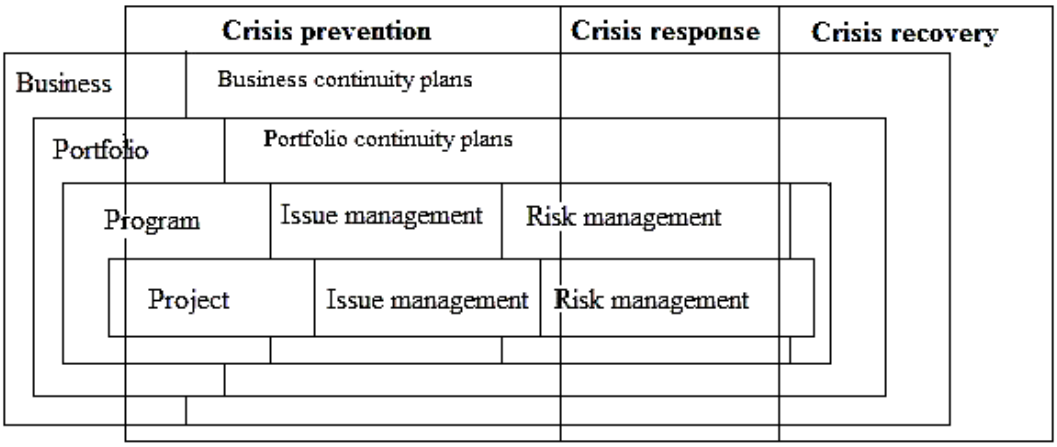

Fig. 1. The crisis management positioning
Source: [7]

In the case of program and project, being a part of a business of a portfolio, all three phases of crisis management should be applied. The preventive phase consists in management, allowing to reach the objectives of a program or project.

All features of crisis management provide parts of at least one of the phases in Figure 1. This paper is focused on crisis in business, portfolio, program and project only.

4.2. Traditional crisis management vs. agile principles

A comparative analysis of the main features characterising the crisis and resulting from definitions (section 1.2) and its management (section 1.3), on the one hand, with items of Agile Manifesto on the other, was made. In the three columns of Table 1, we find respectively: the main features of crisis/crisis management, the items of Agile Manifesto, corresponding to the respective features, and necessary explanations and justification.

Table 1. Crisis *vs*. Agile – comparative analyse

Main crisis features	Agile items	Explanation, justification
Abnormal/unusual situation	**Customer collaboration** over contract negotiation **Responding to change** over following a plan	In an abnormal/unusual situation, it is necessary to work together with all stakeholders
Instability	**Individuals and interactions** over processes and tools	Stabilisation depends mainly on people and their relationships
Loss of control	**Responding to change** over following a plan	Loss of control means that a plan is not applicable
Specificity	**Customer collaboration** over contract negotiation	In such specific situation as the crisis, it is necessary to work together with all stakeholders
Changes	**Working software** over comprehensive documentation	No documentation can ensure crisis recovery
Serious consequences	**Working software** over comprehensive documentation	No documentation can ensure a crisis recovery

Main crisis features	Agile items	Explanation, justification
Disruption of the balance	**Responding to change** over following a plan	Loss of control means that any plan is applicable
Disaster	**Working software** over comprehensive documentation **Customer collaboration** over contract negotiation	No documentation can ensure a crisis recovery In such perspective as the disaster, no negotiations are helpful; a common effort with engagement of all stakeholders is the only possibility
Human factor	**Customer collaboration** over contract negotiation **Responding to change** over following a plan **Individuals and interactions** over processes and tools	Collaboration with all stakeholders is a part of human relations Responding to change, taking into account all parties involved Solution of crisis problem depends mainly on people and their relationships
Stakeholders involvement	**Customer collaboration** over contract negotiation	By definition of both
Crisis anticipation	**Customer collaboration** over contract negotiation	Such collaboration could help detect very early signs of crisis
Decision making in lack of time and information circumstances	**Responding to change** over following a plan	Lack of time and information make plans useless
Possible catastrophic final	**Working software** over comprehensive documentation **Customer collaboration** over contract negotiation	No documentation can ensure a crisis recovery In such perspective as the disaster, no negotiations are helpful; a common effort with all stakeholders is the only way of action
Communication	**Customer collaboration** over contract negotiation **Individuals and interactions** over processes and tools	Collaborating with stakeholders – communicate As above
Mentality shared	**Customer collaboration** over contract negotiation **Individuals and interactions** over processes and tools	Collaboration is an excellent opportunity to share mentality Interactions between individuals help share mentality
Leadership	**All four of Agile items**	Only an adequate leadership is able to apply all items effectively
Coordination	**Customer collaboration** over contract negotiation **Individuals and interactions** over processes	Coordination without collaboration is impossible People should interact to make coordination possible

Source: Authors.

The table above points to close congruency between the main crisis and crisis management features on the one hand, and four items of Agile Manifesto on the other. It can be explained by the dynamic development of IT technologies, their resulting short lifetime, and consequently the impatience of costumer, rapid changes of their needs concerning the final product, lack of time and serious consequences of a possible failure.

4.2. The proposal of an agile approach to the crisis management

The idea is to choose one of the agile methodologies and apply it to crisis management. Scrum [25] is the most popular agile methodology in IT projects [24]. There is a lot of empirical data confirming its efficiency [24]. Such approach to risk management has recently been studies and proposed.

This proposal is limited to the elements presented in Scrum and evolving their analogues in agile crisis management.

Following the Scrum methodology, three basic elements should be defined: Crisis Roles, Crisis Artefacts and Crisis Events. These notions are analogous to the respective notions in Scrum [25, p. 3].

Crisis Roles: A Crisis Team, that is a self-organising, inter-functional team, consists of a Crisis Master, a Product Owner and a Development Team. Their roles and responsibilities should be specified after a thorough analysis of corresponding roles in Scrum [25, p. 4-6].

Crisis Artefacts: in other words, Crisis Artefacts represent work – everything that should be done or activities already accomplished. Following Scrum [25, p. 12-5], three artefacts are defined:

- Crisis Product Backlog – list of all elements, which must be implemented in a final product, e.g. crisis recovery,
- Crisis Sprint Backlog – a set of elements, from Crisis Product Backing, selected for the next Sprint (the notion of "Sprint" will be explained below, in **"Crisis Events"**),
- Crisis Increment – the amount of all elements of Crisis Product Backlog, finished during the current and all previous Sprints**.**

Crisis Events: there are five main events in Scrum [25, p. 7-12]. In this proposal of agile crisis management, they are renamed as follows:

- Crisis Sprint, being an essence of methodology, building its iteratively. Its duration is one month, and it serves to do Crisis Increment,
- Planning Crisis Sprint – this event starts each Crisis Sprint,
- Daily Crisis – a daily meeting (about 15 minutes), its objective is to answer three questions [25, p. 10],
- Crisis Sprint Review – a meeting organised at the end of Crisis Sprint, whose main objective is the inspection of Crisis Increment and updating Crisis Product Backlog. Maximal duration is four hours,
- Crisis Sprint Retrospective, the last meeting of Crisis Sprint. Its purpose is, generally, the analysis of the finished Crisis Sprint.

The idea presented in this paper has been just born and, consequently, all statements above are merely an outline and should be considered as a starting point for developing a complete methodology.

Summary

An attempt has been made to propose a new approach to crisis management. Its starting point is the similarity of the main crisis and its management features with some elements of agile methodologies. It is encouraging enough to make crisis management as deformalised as possible, which would practically eliminate bureaucracy. The proposal is not yet a methodology – the purpose of this article is to show such a possibility and to invite specialists in crisis management to make a more profound analysis of how an agile approach can be applied for this aim. In Scrum, there are numerous agile tools, used in IT project practice. There are three possibilities to obtain appropriate tools for crisis management: use of already existing tools, use of existing tools after necessary modifications, or the development new tools. The first proposal concerning risk management has recently been published. This work should be done for all three phases of crisis management (Fig. 1) and it should be primarily in the form of empirical research.

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Conflict of interests

The authors declared no conflict of interests.

Author contributions

All authors contributed to the interpretation of results and writing of the paper. All authors read and approved the final manuscript.

Ethical statement

The research complies with all national and international ethical requirements.

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Biographical notes

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	Zwinne zarządzanie kryzysowe
STRESZCZENIE	Artykuł dotyczy zarządzania kryzysowego. Autorzy zaproponowali nowe podejście oparte na zwinnych metodach zarządzania projektami. W pracy zaprezentowano kolejno: kryzys i zarządzanie nim (przegląd literatury), charakterystykę projektów informatycznych, zwinne zarządzanie projektami, analizę porównawczą zwinnego podejścia i zarządzania kryzysowego, propozycję nowego pomysłu – zwinne zarządzanie kryzysowe. We wnioskach podkreślono potrzebę kontynuacji prowadzonych badań empirycznych.
SŁOWA KLUCZOWE	projekty IT, kryzys, zarządzanie, Scrum

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