



Research Article

How to Identify and Assess Risk Factors for Large-scale Running Events: The Organizers' Perspective

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Abstract

Marathon is one of the fastest growing sports disciplines and it generally boasts a large number of participants from around the world. As the organization and management of large-scale running events poses a real challenge, risk evaluation should always precede the decision-making regarding the safety and precautionary measures. The purpose of the research is to identify and assess the risk factors of large-scale running events, taking marathons organized in Poland as an example. Fourteen of the largest marathons held in 2017 in Poland were considered in the study. Fifteen experts were questioned using the Delphi method to carry out the multistage identification of risk factors for the organization of a large-scale run, while 31 practitioners - the representatives of marathon organizing teams - conducted the risk assessment. Considering the effect and likelihood of the appearance of an adverse event, the most important risks turned out to be those related to the financing of marathons, organization issues, including the event start date, the acceptance of the local community, the organization of the finish line, delayed start, cyber security, disclosure of personal data and problems with the measurement of time. The obtained results may serve as reliable input data for the efficient risk management of sporting events (runs in particular). Professional risk management, based on the risk factors database worked out as a result of the research, may become a starting point to provide the highest possible level of safety and satisfaction for all the stakeholders involved in the event.

Keywords: Risk Management, Risk Factors for Marathons, ISO 31000, Safety, Satisfaction.

Introduction

Recreational running, as one of the most accessible forms of exercise, is not only a physical activity that serves as a preventive health action, but also a widely practiced sport (Petridis, 2015).

Running started to gain popularity in Poland at the beginning of the 21st century, – whereas, it was already popular in the west in the 1970s.. Approximately, 20% of the adult population of Poles are now practicing recreational running, which is the highest percentage in Central and Eastern Europe (Poland Runs, National Runners Survey, 2014). Most runners, within less than a year after starting regular training, begin to passively and, eventually, actively participate in mass running events (Dzięgiel & Lubowiecki-Vikuk, 2013; Petridis, 2015). Interestingly, runners rarely choose to take part in one or two marathons a year. They often participate in a few or even several large-scale running events over the course of a year (Hitchings & Latham, 2017).

Large-scale running events arouse a lot of emotions and are associated with great expectations of the organizers, participants, spectators and sponsors. Engaging large funds also carries a lot of uncertainty in many organizational aspects (Fuller & Drawer, 2004; Leopkey & Parent, 2009). Their complexity results from legal and formal requirements as well as the fact that each event and even each subsequent edition is different, which limits the possibility of using standard solutions. The specificity of a running event also results from the limited possibility to introduce changes during the event, which excludes the improvement of a plan during its implementation. The diversity of the number of participants and their sporting level, as well as the limited time and date of the event should also be taken into account (Scheerder, Breedveld & Borgers, 2015). All of that explains why the professional management of sporting events is a necessary element to effectively carry out a project, such as organizing a running event.

Participants of marathons, in addition to professional runners, are more often amateurs. An ever-increasing amateur participation in marathons driven by the will to compete with others, test themselves, and experience something new and extreme also creates a certain risk, which is now becoming ever important and hard to control. 'When the person is inexperienced, it is likely that he/she does not understand the potential risk that may be present during the competition' (Miller, Pauline & Wendt, 2013, p. 18). Accepting the risk of the event may be the result of not knowing the actual levels of risk involved (Fuller & Drawer, 2004). Therefore, the sporting event managers have a major responsibility towards identifying and managing the risk associated with the running event. Risk management becomes crucial when the participation in a sporting event, such as a long-distance run, requires neither a certain level of experience, nor a medical certificate of good health condition.

Although large-scale sporting event risk management policies have been analyzed and discussed in general, little research has been conducted regarding risk management in running events (Miller, Pauline & Wendt, 2013; Moyle, Kennelly & Lamont, 2014). That is why an answer to the following research question has been sought: How can the organizers of running events ensure a safe and satisfying environment for the participants (mostly amateurs) and manage the risk for a long-distance running event professionally. The long-term goal of the research is to add the knowledge about practical aspects of risk management to the evolving industry of large-scale running events in Central and Eastern Europe, so that the records of risk identified by the experts and verified by the practitioners could be mitigated and controlled.

Research problem in the context of literature

Risk can be treated as a threat of 'any future incident that will negatively influence the event' (Bowdin et al., 2006, p. 318), or neutrally as a tool useful to 'minimize

liabilities and maximize opportunities” (Silvers, 2008, p. 22). It is worth emphasizing that the word ‘risk’ comes from the Latin word ‘riscore’, meaning -dare, which means that it should be perceived as a conscious choice, not a necessity. However, it should also be noted that risk is often not fully realized (Appenzeller, 2005; Boo & Gu, 2010). Running events’ organizers carry risks that are both known and unknown to the administrator. While running events’ directors have the responsibility to provide the safest conditions possible, participants have an equally important responsibility to ensure their own physical readiness to undertake such activity (Boo & Gu, 2010; Fuller & Drawer, 2004).

Sport events are carried out in conditions of uncertainty, which is due to internal and external factors (DSDM Consortium, 2010); however, there is ambiguity regarding the relation between risk and uncertainty. It happens that both terms are used interchangeably, but it can also be stated that uncertainty in the shorter periods takes the form of risk, or that ‘the risk is a specific uncertainty’ (DSDM Consortium, 2010, p.12). The ISO 31000 standard defines risk as the effect of uncertainty in pursuing a set goal (ISO 31000, 2018) and draws attention to the management of diversified risk. The standard also emphasizes the need for an individual approach to the definition adjustment as well as to the consideration of specific needs. Risk management includes context determination, risk assessment (including risk identification, analysis and evaluation) and risk treatment (ISO 31000, 2018).

In the literature on the event organization, risk management is often referred to as an action that aims at controlling the impact of unforeseen issues or accidents that take place within an event; thus, it is a proactive process (Ammon & Brown, 2007; Hanstad, 2012; Leopkey & Parent, 2009).

It is indicated that risk management in large-scale sporting events is becoming increasingly important and should be explored from different perspectives, as the holistic approach is recommended (Moyle

et al., 2014; Leopkey & Parent, 2009; Emery, 2010). However, governing bodies are the authorities that are majorly responsible for identifying and managing the risks associated with the event (Fuller & Drawer, 2004). In Europe, the problem of the organization of large-scale running events and their risk assessment was rarely analyzed (Miśniakiewicz & Łuczak, 2014; Kose, Argan & Argan, 2011). Most papers on events risk management and reports on sport events risks come from the US, Canada and Australia (Appenzeller, 2005; Nohr, 2009; Leopkey & Parent, 2009; Matheson, 2006).

Various studies have been conducted in the field of sport and sporting event risk management. The researchers have usually centered their interest on security and crowd control (Appenzeller, 2005; Giulianotti & Klauser, 2010; Zoltak, 2001), injuries (Fuller & Drawer, 2004; Hespanhol, Pena Costa & Lopes, 2013), facility management (Preuss, 2007), effect of terrorism (Giulianotti & Klauser, 2010; Toohey & Taylor, 2008), actual losses caused by an event (Crompton, 1995) and lack of organizational planning (Getz, 2002). Special attention was paid to the overall impact of a sporting event on stakeholders (Leopkey & Parent, 2009) and risk management strategies by stakeholders, as well as on practices (managers’ profile, skills required and critical success factors) in sporting events (Emery, 2010). Different perspectives have been taken into account within risk management – the stakeholders in general (Leopkey & Parent, 2009) and participants in particular (Hanstad, 2012; Fuller & Drawer, 2004). Sporting event managers’ attitude, beliefs and constraints have been also analyzed (Reid & Ritchie, 2011).

Furthermore, risk issue categories by stakeholder groups have been identified (Leopkey & Parent, 2009). The study provided the list of 14 risk issue categories important when dealing with risk management in sporting events: environmental, financial, human resources, infrastructure, interdependence, legacy, media, operations, organizing, participation, political, relationship,

visibility and human resources. It was the starting point for the research on the assessment of risk management in large-scale running events.

Until now, researchers were mostly focused on sporting events of international importance that were considered in the social, economic, promotional or planning context (Boo & Gu, 2010; Toohey & Taylor, 2008). There are few studies on events carried out for amateurs (i.e. Miśniakiewicz & Łuczak 2014). The intention of the authors was to fill this gap. In the light of critical evaluations of the legitimacy of the organization of mega events - debatable social and financial benefits that most often

demonstrate the legitimacy of their organization (Crompton, 1995; Preuss, 2007), it can be concluded that the smaller sporting events of national and local importance will be those that shall gain popularity in the future (Matheson, 2006).

Methods

The paper is based on the preparatory research (1) conducted in 2017 and the main research (2) conducted in 2017-2018. They aimed at identifying risk factors and estimating the risk related to organizing marathons (Table 1).

Table 1: Characteristics of the preparatory and the main study

	Preparatory research	Main research
Research method, conducted analyses	Delphi method	Reliability analysis, risk assessment; cluster analysis, factor analysis
Research tool	Discussed questionnaire	Questionnaire
Size of population sample	15 experts	31 representatives of 14 marathons
Duration of research	2017	2017-2018
Research objective	Identification and grouping of risk factors related to organizing marathons. Preparation of the proper research	Risk assessment and analysis in reference to organizing marathons
IT tools, form of research realization	E-mail contact, meetings	e-risk app

Source: own research.

Within the preparatory research, the Delphi method (Thangaratnam & Redman, 2005) was applied. The research involved fifteen experts in organizing long-distance runs. The experts were experienced participants (5), marathons organizers (5) and researchers in the areas of sports and project management (5).

The authors prepared a list of risk factors on the basis of the relevant professional literature (Leopkey & Parent, 2009), own experience and legal requirements in Poland, and grouped them with the use of the Ishikawa diagram. The list of factors arranged in this form was sent via Internet

to research participants, who shared their remarks, i.e. confirmed the validity of the included risk factors or considered them inadequate. They also proposed other factors and additional risk factor groups. After having taken participants' remarks into account, the material was sent again several times. The remarks were exchanged a few times (5-9) with most experts, which led to the modification of the factors list. These actions amounted to the basis of the research questionnaire.

The reliability analysis (Cronbach, 1951; Peterson, 1994) of the questionnaire was applied with the use of the Cronbach's alpha

statistics to confirm the adequacy of the applied research instrument (Peterson, 1994). The Cronbach's alpha statistics result reached the level of 0.933 (21 positions). According to the classical interpretation, the coefficient should have the minimum value of 0.6, whereas the preferable value of the coefficient is approx. 0.9. Thus, the internal

cohesion of the research instrument was confirmed.

Within the main research, the agreed risk factors were evaluated on a scale ranging from 1 to 4, according to their significance (impact) and probability of occurrence (Table 2).

Table 2: Characteristics of selected values in the proper research.

Scale	Probability		Impact	
1	Marginal and low (0-30%)	<ul style="list-style-type: none"> Risk will not occur or will occur occasionally Expected number of occurrences within a period: less than 1 time in 5 editions. 	Insignificant	Difficulty in realizing a sporting event, which influences its course and objective realization in an insignificant way
2	Medium (31-60%)	<ul style="list-style-type: none"> Risk occurrence is real, but does not exceed 60%. 1 occurrence in the last two editions. 	Medium	Clear and tangible impact on the organization and the course of a sporting event as well as the realization of objectives
3	High (61-80%)	<ul style="list-style-type: none"> There are rational premises that the risk will materialize. It occurred once in the last edition. 	Large	Significant impact on the organization and the course of a sporting event as well as the realization of objectives, including the ones related to health. Large impact on an event's reputation
4	Very high (81-100%)	<ul style="list-style-type: none"> There are rational premises that the risk will almost surely materialize. In the last edition, it occurred at least 2 times. 	Very significant	Related to the health and life of participants. The necessity to terminate the event. No objectives are achieved.

Source: own study based on ISO 31000.

The research was supported by the IT tool e-risk (e-risk.pl). It allows for multi-dimensional configurability in reference to the methodology and risk factors. Moreover, it enables the full control of the activity of research participants. Three experienced representatives of selected marathons carried out the risk assessment. All fourteen analysed marathons were city runs held on

flat or moderate terrains in Poland. Therefore, the events were similar in many aspects, e.g. climate conditions, participants' profile, the declared standard of organization, and legal regulations relevant to the organization process.

Research Results

The research resulted in approving 75 risk factors divided into nine groups: Safety (1), Budget and finance (2), Information (3), Comfort and satisfaction of participants (4),

Organization (5), Start package (6), Recovery and energy support (7), Reputation (8), Environment and force majeure (9). Within each factor group, more specific risk factors were further indicated (Table 3).

Table 3: Groups and risk factors – the result of the preparatory research

Group 1. Safety	Group 2. Budget and finance	Group 3. Information
1.1. A serious accident on the route 1.2. An intrusion of a third party onto the running route 1.3. A participant with a poor health condition 1.4. A collision between people, people and objects, etc. on the running route 1.5. A terrorist attack 1.6. Intentional pollution/spoilage of food/beverages available along the route/in the finish zone 1.7. Insufficient medical support	2.1. Insufficient income from participants' fees 2.2. Insufficient funding from sponsors 2.3. Insolvency 2.4. Lack of profit at the planned level 2.5. Time overlapping with another rival event 2.6. Huge participation fees	3.1. Obsolete news on the website 3.2. Lack of/insufficient contact with potential participants 3.3. Insufficient promotion/information on external websites 3.4. Unintended disclosure of personal data 3.5. Personal data theft 3.6. A cyber attack – modification, blocking of the website 3.7. Lack of a clear, interactive map of the route 3.8. Lack of early information about the result
Group 4. Comfort and satisfaction of participants	Group 5. Organization	Group 6. Start package and medal
4.1. Lack of free accommodation 4.2. Poor organization of the deposit office 4.3. Difficulty in reaching the start line of the marathon 4.4. Lack of parking spaces close to the start zone 4.5. Inability to receive start packages on the day of competition 4.6. Mass start (not in waves) 4.7. An inappropriately narrow route, 4.8. Lack of/unclear information about the covered distance 4.9. An unattractive route 4.10. An unattractive expo, a poorly-located expo 4.11. Lack of access to showers after the competition	5.1. Inappropriate running route identification 5.2. Insufficient access to toilets 5.3. Unattractive catering at the finish line 5.4. Impossibility of gathering spectators in the start and finish zones 5.5. Inappropriate organization of the run – jams after the beginning of the event 5.6. Inappropriate organization of the finish line 5.7. Lack of the appropriate atmosphere during the event 5.8. Problems related to organization, time of the event etc. by the local community and the administration 5.9. Delayed starting time of the event 5.10. An unusually smaller number of nutrition points	6.1. An unattractive start package 6.2. An unattractive design of the medal 6.3. An insufficient number of medals 6.4. An insufficient number of start packages

	5.11. Inappropriate organization of nutrition points 5.12. An insufficient number of volunteers 5.13. Lack of volunteers' engagement 5.14. Faulty time measurement 5.15. Lack of established procedures 5.16. Limited human resources 5.17. Incompatibility of the running route capacity with the number of participants	
Group 7. Recovery and energy support	Group 8. Reputation	Group 9. Environment and force majeure
7.1. Lack of access to massage in the finish zone 7.2. Lack of the appropriate hydration of participants 7.3. An insufficient amount of water at recovery points 7.4. An insufficient number of isotonic drinks at recovery points 7.5. An insufficient number of energy gels, fruits etc. at recovery points 7.6. Random choice of nutritional products at recovery points and the finish line 7.7. Low health quality of the offered nutritional and recovery products 7.8. Lack of the nutritional awareness of participants 7.9. Lack of nutritionists' support 7.10. Lack of/insufficient number of cooling points along the route	8.1. Unfavorable media information on the national scale 8.2. Unfavorable media information on the local scale 8.3. Lack of information about the event in the national media 8.4. Lack of information about the event in the local media 8.5. An insufficient number of participants 8.6. A rival local event	9.1. Downpour 9.2. Strong wind 9.3. An overly low temperature 9.4. An overly high temperature 9.5. Difficult conditions of the running route 9.6. Traffic in the direct vicinity of the event 9.7. Force majeure

Source: own research.

Experts emphasized the importance of factors related to the physical safety of participants and organization. They also stressed risks linked with accidents on the route, bad health condition of participants, as well as terrorist and bioterrorist threats. Furthermore, personal data protection, especially compliance with GDPR, turned out to be significant. Experts clearly

recognized the risk related to not assuring participants' satisfaction. In the questionnaire, they took account of issues linked with start packages, start organization, route attractiveness and deposit organization. Finally, the risk factors resulting from the preparatory research were used in the risk assessment conducted in the main research.

The average values of risk factors were calculated considering the ones of the highest risk and the largest frequency. Five groups of risk factors were distinguished:

- Most significant (15) – the average value from 5.10 to 6.23,
- Less significant (21) – the average value from 4.14 to 4.94,
- Neutral (18) – the average value from 3.14 to 3.90,
- Of little significance (9) – the average value from 2.48 to 2.95,

- Insignificant (13) – the average value from 1.33 to 2.24.

Respondents indicated the risk related to financing a marathon as the most significant one (insufficient income, profit at an unsatisfactory level, insolvency), followed by: organization (limited human resources, inappropriate organization, delayed start, incompatibility of the running route capacity with the number of participants), safety issues related to terrorist threats, cyber safety and participant's health condition (Table 4).

Table 4: The most significant and the less significant risk factors of organizing a marathon

Code	The most significant risk factors	Average	Range	Standard deviation
2.2.	Insufficient funding from sponsors	6.23	7.53	2.50
5.16.	Limited human resources	6.03	5.00	1.56
5.8.	Problems related to organization	6.01	7.50	2.35
9.7.	Force majeure	5.97	6.00	1.96
2.5.	Time overlapping with another rival event	5.93	3.00	0.92
5.6.	Inappropriate organization of the finish line	5.92	6.00	1.67
3.4.	Unintended disclosure of personal data	5.79	6.75	2.39
5.14	Faulty time measurement	5.77	7.50	2.55
2.1.	Insufficient income from participants' fees	5.71	5.89	1.86
6.3.	An insufficient number of medals	5.71	4.50	1.45
2.4.	Lack of profit at the planned level	5.27	7.00	2.13
3.6.	A cyber attack – modification, blocking of the website	5.26	6.75	2.34
5.9.	Delayed starting time of the event	5.26	3.44	1.00
5.17.	Incompatibility of the running route capacity and the number of the participants	5.17	5.50	1.69
2.3.	Insolvency	5.10	7.78	2.69
Code	Less significant risk factors	Average	Range	Standard deviation
6.1.	An unattractive start package	4.94	4.50	1.54
8.1.	Unfavorable media information on the national scale	4.85	6.50	1.74
4.5.	Inability to receive start packages on the day of competition	4.79	6.89	1.99
5.13.	Lack of volunteers' engagement	4.69	3.25	0.99
5.5.	Inappropriate organization of the run – jams after the beginning of the event	4.68	3.67	1.05
9.1.	Downpour	4.68	4.75	1.48
3.5.	Personal data theft	4.61	4.00	1.39
8.5.	An insufficient number of participants (too little interest)	4.56	6.00	1.79
3.3.	Insufficient promotion/information on external websites	4.53	4.25	1.40
4.7.	An inappropriately narrow route	4.51	4.50	1.57

5.1.	Inappropriate running route identification	4.41	5.00	1.74
5.12.	An insufficient number of volunteers	4.40	4.50	1.45
9.4.	An overly high temperature	4.37	5.25	1.64
1.1	A serious accident on the route	4.36	3.25	1.14
7.3.	An insufficient amount of water at recovery points	4.35	5.00	1.72
1.2	An intrusion of a third party onto the running route	4.23	3.75	1.21
4.3.	Difficulty in reaching the start line of the marathon	4.19	5.00	1.89
4.2.	Poor organization of the deposit office	4.17	2.50	0.92
8.6.	A rival local event	4.16	8.00	2.36
1.5.	A terrorist attack (an explosion, shooting, ramming)	4.15	6.00	1.89
1.7.	Insufficient medical support	4.14	5.50	1.55

Source: own research.

These findings are found useful when focusing on specific factors and making organizational decisions. It can be observed that problems with funding and organization (limited human resources) are important. For participants and spectators likewise, it is a big festival; however, cyclical events disorganize the life of the local community. What is more, the substantial number of events and the season "limited" by the calendar often lead to a decrease in the number of participants due to rival marathons organized at the same time. It is worth noting that the importance of threats to the safety of participants and viewers, the risk of a terrorist attack, and the need to protect personal data are increasing nowadays (Lamont & Kennelly, 2012; Toohey & Taylor, 2008) as suggested by the obtained results.

Conclusions

The presented research has pioneered the systematic and methodological risk assessment of organizing large-scale running events, taking marathons held in Poland as an example. It may become a starting point for conducting further studies in reference to risk analysis and taking mitigation actions as well as examining their efficiency.

As a result, a database of risk factors (75) was developed regarding the organization of long-distance runs (marathons). Those factors were divided into separate groups (Security, Budget and Finances, Information, Comfort and Satisfaction of Participants, Organization, Starter Pack and Medal, Regeneration and Energy Support,

Reputation, Environment and Force Majeure).

After assessing the risk, taking into account the effect and the likelihood of a given factor, 5 groups of risk factors were identified (the most important, less important, neutral, not important and insignificant). The most important factors are related to the financing of marathons, organization issues, including the start date, the acceptance of the local community, the organization of the finish line, delayed starting time of the event, cyber security, disclosure of personal data, and problems with the measurement of time.

The research resulted in obtaining unequivocal data of risks on which mitigation actions should be centered. The risks are related to assuring funding for marathons, physical safety and personal data protection. The substantial number of marathons (and other sporting events) makes it extremely difficult to find such an event date that does not overlap with other runs and is favorable in the context of weather conditions. The most significant factors included threats leading to accidents on the route, which call for security measures, but also generally point to an insufficient number or lack of security services' engagement.

The research findings have led to the development of the elementary database of risk factors and the verification of the applied methodology (including the e-risk application). Moreover, the research may serve as a methodological source for any marathon organizer.

The emerging industry of large-scale running events, as in the example of Poland shows, needs a mature approach to risk management. Although the “consideration of risk, only from the perspective of event organizers, is myopic” (Moyle et al., 2014, p. 102), there must be something to start with, as the organizers should “expect the best and prepare for the worst” (Moyle et al., 2014, pp.102-103). The risk assessment of marathons from the organizers’ point of view seems to be a step in the right direction. Taking into account the perspective of a large-scale running event organizer, the analysis and evaluation of risks associated with the organization and execution can help develop more effective plans to minimize these threats. The most significant risks that should always be appraised by the management system were indicated in the study. If duly considered, they will surely help increase the security of mass participation races and the level of confidence of both organizers and participants.

Disclosure Statement

The authors reported no potential conflict of interest.

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