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**How much important is IT project management for Olympic Games success?
Rio2016 Case Study**

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ABSTRACT

Information technology has an important role in many businesses and in Olympic Games is not different, but when we think about IT project management, immediately a question comes up. How much important is IT project management for Olympic Games success? Information technology department in general has the second biggest budget in the Organizing Committees for Olympic Games (OCOGs). Due to the improvements in sports and consequently their dependency from technology, we can say that is almost impossible to realize games without a huge technology set of products and services. Considering as well, that technology is one of the infrastructure areas that provides services to the others functional areas, manage professionally a portfolio of projects became mandatory, not only for technology, but also to the entire committee in order to achieve the games organization goals. Olympic Games is a megaproject which needs to be planned and managed based on recognized best project management practices. Scope, time, cost, and quality are the minimal aspects that must be managed for functional areas in an integrated manner. Manage IT projects it is not an easy thing, especially because IT projects are the ones with the highest rate of failure, which means that usually these projects do not achieve their goals and realize the benefits planned usually affecting companies businesses.

1   INTRODUCTION

Olympic Games are a megaproject that involves and integrates many companies and resources, which means hundreds of stakeholders. Information technology in this environment has a main role providing goods and services to support stakeholders operation. Technology project management has been discussed broadly, and for Olympics success, it shows up more crucial. Organizing Committee for Olympic Games (OCOG) functional areas depend on technology goods and services to work and support their operation. Technology is one of the six Games infrastructure providers that support all functional areas, as shown by figure 1 below:
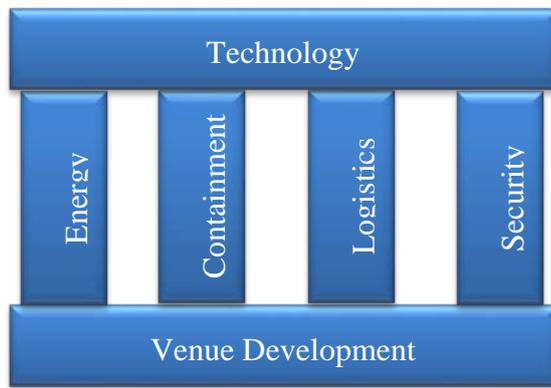
Figure 1 - Venue infrastructure providers

To provide its services to internal and external clients technology needs some suppliers and partners, which must be integrated, and aligned with Olympics project management practices, assumptions, tools, timeframes, and goals. This scenario demands more professionalism in project management, and makes it more critical to the Olympics goals achievement.

Technology has one of the biggest budgets in the OCOGs. For an example, in Rio2016 the budget is distributed according to the table 1 given below:

Table 1- Rio2016 Budget Distribution

Area	Percentage
Administration and Commercial	26%
Technology	19%
Infrastructure Projects	13%
Sports and Ceremonies	10%

Area	Percentage
Accommodation	10%
Games Services	8%
Marketing Rights and Contingencies	6%
Transport	4%
Engagement	4%

As shown in the table 1 above, technology has the second biggest budget in Rio2016 demonstrating the investment in IT and its importance to The Games (Rio2016 Organising Committee of Olympic and Paralympic Games, 2016). Without Technology supports, Games are almost impossible to be performed nowadays.

As demonstrated in the figure 1, technology depends on Venue Development, Energy, Containment, Logistics, and Security to implement its services on the venue level. This means that align assumptions, scope, and time with these areas must be the main Information Technology project management objective to turn Technology Functional Area able to provide its products and services on time, on budget, and according to the scope aligned. All of the venue infrastructure providers must have a portfolio of projects aligned among them, but the issue presented here is the timeframe of each functional area conception and its maturity on the project management. Integration it is not easy in a regular project and in a megaproject like as Olympics shows up more complex and difficult to reach, due to the quantity of stakeholders, projects, assumptions, and constraints to cope with. Another variable that comes up in the context is that IT project management must be as simple as possible to ensure its uses, and to make it possible to standardize.

In order to analyze the Information Technology project management in Olympic Games this research will try to answer the research question "IT project management impacts on Olympics Games success?"

According to the structure of this paper it will present research methodology applied, a literature review that covers project management, Olympic Games, IT project management, and project management success. It will discuss the impacts of IT project management on Olympic Games success using Rio2016 as a case study.

2 RESEARCH METHODOLOGY

The methodological approach of the research was qualitative and the main technique to collect and analyze data was content analysis from the literature review of papers on project management, IT project management, project management success, Rio2016 and Olympic Games. It was used a systematic analysis to identify keywords

contained in papers selected from the scientific databases. The search of articles was based on the keywords "project management", "Project Management Success", "Rio2016" and "Olympic Games" and the period being considered was the last 5 years.

The other technique of data collection was observation and participation of researcher and interview IT Project Managers with Games previous experience and IT clients of the Rio2016 Organizing Committee for the Olympic Games to understand the importance of IT Project Management to The Olympics business.

3   LITERATURE REVIEW

3.1   Olympic Games

Olympic Games are the most important multi-sport event in the world, which are divided in summer and winter editions. There are adults and youth Games, both of them have summer and winter editions. Summer and Winter Games happen every four years, which means that every 2 years an Olympic event happens. Future games editions are shown in the figure below:
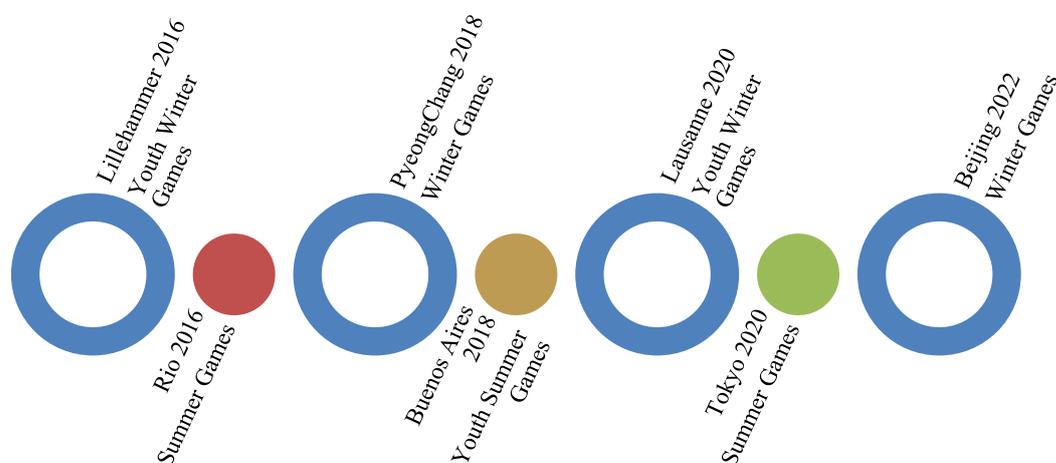
Figure 2 – Future Games Editions

International Olympic Committee is the owner of Olympic Games rights. To host one edition of The Olympics cities have to participate of the bidding process. The host city election takes place seven years before the Games, but the actual candidature process is launched 10 years before and lasts for a period of approximately three years (International Olympic Committee, 2016). Olympic and Paralympic Games happen

in the same city, one after another. For example, in summer Games, Olympic Games happen in August and Paralympic in September. Olympic Games in general must demand a huge investment from the host city to build venues according to the Olympics requirements (The London Organising Committee of the Olympic Games and Paralympic Games, 2013).

Olympic Games are complex and demands project management usage since bid process (GARGALIANOS, TOOHEY, & STOTLAR, 2015).

At least, time, cost, scope, and quality must be managed in Olympic Games project in a professional manner (EAGER, 1997).

Olympic Games have been increasing every edition in cost, size, and complexity, which creates difficult to have many candidates as host cities (CHAPPELET, 2014) (MÜLLER, 2015).

3.2   Megaproject

According to (FLYVBJERG, 2014) Megaproject is a type of project that cost at least 1 billion dollars, takes many years to be developed, involves many stakeholders, and affects many people. Olympic Games project fits 100 percent on this concept.

Megaproject demands a huge investment, is risky, scope changes significantly over time, usually has public and private entities participation, and, often creates legacy, such as venues, bridges, airports, seaports, and others.

Megaprojects are well known as infrastructure projects, complex projects are another possible name, and its planning process is complex and tough to do.

Megaprojects usually become extremely complex due to the quantity of stakeholders involved in and as a result there a lot of challenges, surprises, issues, and problems to deal with (GIEZEN, BERTOLINI, & SALET, 2015).

Many projects managers have tried to keep megaproject planning as much as simple, understanding that this strategy creates a good advantage for them (GIEZEN, 2012).

3.3   Project Management

Project management is the application of knowledge, skills, tools, and techniques to project activities and tasks to meet the project requirements (PROJECT MANAGEMENT INSTITUTE, 2013).

Currently, project management knowledge and skills has been more expected and demanded from professionals especially in Information Technology field.

At least, the content of project management published by Project Management Institute via Project Management Body of Knowledge is expected to be used to manage projects.

Project management has been widely applied worldwide. Information Technology and its professionals are one of the biggest areas that invested a lot of money on tools, training, and, methodologies to improve their project management competencies.

3.4 Project Management Success

The concept of project management success is related to achieve project goals established in Project Management Plan. Usually, time, cost, and scope aspects achievement are considered in project goals and objectives. This means that if a project time, cost, and scope variables were achieved according to the project management plan, the project success is reached.

3.5 Rio2016

For the first time, South America hosts an edition of Olympics. Rio de Janeiro was chosen in 2009 to host the 2016 Olympics edition, and since there the city and Organizing Committee created by plan the Games have been working on Olympic Games planning.

Rio2016 Olympic and Paralympic Games will be performed in four regions of the city: Barra da Tijuca, Copacabana, Maracanã, and Deodoro. In these regions competitions will be performed. Main Press Center, International Broadcast Center and Athletes Olympic Village are located in Barra da Tijuca region (Rio2016 Organising Committee of Olympic and Paralympic Games, 2016).

Rio de Janeiro city is responsible to provide the public infrastructure to the Games, such as transportation. City is also responsible to build some Games venues in a legacy mode.

Rio2016 Olympic Games will be performed from 5 to 21 August, and Paralympic Games will be performed from 7 to 18 September 2016.

According to (Rio2016 Organising Committee of Olympic and Paralympic Games, 2016), Rio2016 numbers show the magnitude of the project, as given below:

- 10,500 athletes from 206 countries, 42 sports, 32 competition venues spread across for regions of the city, 39 test events, 2 technical rehearsals, 7.5 million tickets, 100,000 chairs, 11 million meals, 60,000 clothing hangers, 34,000 beds, 45,000 volunteers, 6,500 employees, 85,000 outsourced staff.

3.6 Rio2016 Technology Department

Rio2016 Technology Department is divided into 6 functional areas, as listed below:

- Technology Program Office (TPO)
- Service Delivery (SDE)
- Technology Systems (TSY)
- Results (RES)

- Telecommunication (TEL)
- Venue Technology Services (VTS)

Functional areas listed above are responsible for providing products and services based on a catalogue, which is presented to all OCOG functional areas.

Technology Program Office is the area responsible for controlling the portfolio of projects, provides support in project management to the other technology areas, develops process and procedures, creates the department governance rules and procedures, and mobilizes technology teams.

Service Delivery is responsible for technology service desk, and to provide products, like as computers and printers to the entire committee.

Technology Systems is responsible for providing applications and systems to the entire committee.

Results is the area responsible for Results Systems Test, Sports Timing and Scoring, and Results processing and distribution on the venue level.

Telecommunication is responsible for providing Fixed and Mobile Telecommunication products and services to the committee.

Venue Technology Services is responsible for collecting functional areas requirements on venue level, venue project management, requests infrastructure services, such as spaces and commodities to host technology goods and services, containment, power, security, logistics, for technology operation on the venue level

Technology department provides goods and services in competition and non-competition venues (hotels, airports, transport garage, logistics distribution center, accommodation villages, athletes village, press and broadcast center)

To provide goods and services to the others functional areas and clients, technology uses many partners and contractors, which are managed by projects.

For technology purpose, each venue is considered one project per type of event Games, Test events, and, Technical Rehearsals.

Technology goods and services provided for functional areas and clients includes: desktops, laptops, printers, radios, mobile phone, landlines, wired and Wi-Fi internet connectivity, network services, TVs, TV signal, videoboards, public and sport scoreboards, projectors, audio systems, intercom, software's, games applications (Commentator Information System, workforce planning), timing and scoring equipment, 3G dongles, tablets, Uninterrupted Power Supply (UPS) units, service desk service, and others.

4   RESULTS AND FINDINGS

Information technology provides a lot of goods and services to OCOG functional areas and clients. To deliver its goods and services Information Technology department uses project management largely. Technology tries to apply as much as possible the knowledge published in PMBOK in its projects. IT projects are managed using CA

Clarity, MS-Project, and standardized documents, and have been achieving its objectives and goals. Researcher observed that some projects were postponed, and presented delays, as often seemed in IT projects, but without significant impacts on functional areas services and deliveries.

For example, Venue Technology Manager (VTM) has a deployment plan that shows all spaces in a venue that requested technology goods and services, and TEC dependency of VED (space, air-conditioning), NRG (power), LOG (furniture), SEC (venue perimeter security) and containment. VTM is able to see the project critical path, and understand the effect of a postponing or delay in a specific cause on the project as whole. Basic project management techniques like as WBS, critical path method, PERT, resource constraints, assumptions and constraints reviews are applied in venue technology project planning.

Every Olympic Edition, functional areas are more dependent of IT goods and services, and this could be seemed clearly in Rio2016 Organizing Committee. To work on venue level since the beginning of construction Functional Areas needs to have mobile services available, at least, but usually they request much more IT support for their operation.

Time, Cost, and Scope aspects have been consistently managed by IT project managers in order to keep the projects on track. OCOG establishes that over cost usually experienced in a megaproject like this (PATEL, BOSELA, & DELATTE, 2013) is unacceptable situation, and based on that IT projects have been led to achieve the cost goal, at least, but ideally, projects must have savings. OCOG functional areas, clients, partners, IOC, and technology project managers interviewed considered IT project management highly important to Olympic Games success due to the broadly usage of IT by clients, and, the sports competition technology dependency. There is no functional area without technology support, as well as, sport that could be performed without technology support.

5   LIMITATIONS

The study was conducted only in Rio2016 Organizing Committee, which makes difficult the extrapolation of results and findings. A study including more OCOGs must be performed in order to extrapolate the results.

6   CONCLUSION

Organizing Committees for Olympic Games have been increasing their dependency of Information Technology goods and services every Games edition, due to the improvements in sports and clients and customers demands by information availability. Information Technology departments, companies and professionals have been investing a huge amount of money to improve their project management competencies and Olympic Games business has been following this tendency. In Rio2016 researcher observed that Information Technology issues could impact on the entire committee, and because of this Information Technology department has been

applying modern project management techniques to ensure to its clients that IT projects will be delivered according to the objectives and goals established and agreed with clients. A small failure in IT projects can stop sport competition, impact on ticketing sale, generate errors on timing and scoring results capturing, processing and publishing, as well as, all mobile, radio, and network telecommunication services. Due to, the importance of IT services and products and it is largely impact on Games services, OCOGs executive boards have been demanding more professionalism to the IT departments. Technology project management success or failure affects directly on Olympic Games success and OCOG, partners, and sponsors image. By this reason, IT project management has been considered highly important to the Olympics, by OCOGs and IOC.

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