



## **TAEKWONDIST ATHLETES: A REFLECTION ON MANAGEMENT AND INFORMATION TECHNOLOGIES.**

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### **SUMMARY**

The objective of this article is to carry out a punctual and introductory discussion about the training management of children's Taekwondist athletes from the Bang Minas team, in the city of Diamantina, Minas Gerais. As a starting point, theoretical references on the management of information and communication services and technologies, the ICTs, which support and make manager's decision-making more efficient. In a second step, a simplified description of the mentioned team's trajectory is presented, which illustrates the importance and timeliness of the theme. We sought, in the short space available for this article, to present the team succinctly, with its challenges and potentialities, pointing out technological possibilities that could help the team manager to achieve his goals meeting the expectations of his clients.

**Key words:** Management, Information and Communication Technologies, Training, Taekwondo.

### **INTRODUCTION**

This article aims to initiate a debate about the restrictions commonly found in Brazil, for the management of the progressive development of the technical skills of students-athletes taekwondistas classified as infantile. Therefore, after using a theoretical framework that will guide the discussion, a case study of the Bang Minas team, from the city of Diamantina, MG, will be presented, in which it is intended to diagnose the interferences, limits and perceived possibilities to achieve the progressive improvement of performance of student-athletes of this modality. It is recognized that not everyone who does some kind of fight, martial art or physical exercise, intends to be a high level athlete, quite the contrary. There are a number of other goals that can be demanded by those who practice sport such as discipline, balance, improved health and desire to lose weight. Either way, a sequential, progressive improvement of the skills worked on is sought and this improvement needs to be visible and measurable. It

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is understood that through a work plan, previously established by the team's technician to promote the individual development of student-athletes, which obeys the objectives expected by the practitioner of fights, it will be possible to frequently evaluate the levels of progress and, thus, verify that the expected goals for which physical activity was initially sought are being achieved. However, a problem already identified in the Bang Minas team, the object of study mentioned above, which has shown growing concern with the accuracy of the process of assessing the performance of students as a whole, and especially for children, it concerns the difficulty of effectively managing the development of their technical, conceptual and behavioral skills. Managing the team's performance, which has been growing continuously, especially with regard to children, becomes an even more complex task in view of the diverse student-athlete profile, ranging from 4 to 40 years of age, and the lack of subsidy didactic-methodological aspect of the modality in relation to the evaluation of child athletes. The hypothesis defended in this article is that taking care of the development of each one of these athletes involves much more than the technical competence of the fight teacher. It requires knowledge about sports management, which includes knowledge about people management, marketing management and operations management. Besides that, information and communication technology, ICTs, are great allies of decision makers in the management process and, for this reason, they can and should be great allies in sport. "The lack of administrative training for managers can also be pointed out as one of the biggest problems in the sports segment, which often directly interferes with the performance of coaches and sportsmen". (MOCSÁNYI, BASTOS, 2005: p.55).

The definition of Sport Management can be understood from concepts brought from the business administration area. In this case, the concept of management is related to the actions of any decision maker who in a business environment must decide on the efficient and effective use of resources, aiming to achieve certain objectives aligned with the purpose of their existence. Take decision (SOBRAL, PECI, 2013: p.144) stage of the administrative process, means planning, organizing, directing and controlling resources, objectives, people and technologies, satisfying the needs not only of the entrepreneur, the manager, but also of all business partners, providing development of the skills of each of them. With regard to the concept of sport, it is understood that this can be "sport itself" in its strict sense and any physical activity, which may be geared to recreation and leisure. Thus, a sports organization offers goods and services that are related to sport and physical activities in general and can be divided into two large groups, the organizations that produce sports services and those that support the production and promotion of these services. Regarding the first group "[...] it can

be from clubs, gyms, or sports schools [...] ”. These would exercise the primary activities responsible for manufacturing or producing the sport activity itself. In this way, it is understood that sports managers must know their entire production process and be prepared to work in these organizations. The second group would be composed of satellite organizations, which support those that produce primary services, “[...] manufacture sports equipment, broadcast games or advise athletes. [...] ”( who provide support to those who produce primary services, “[...] manufacture sports equipment, broadcast games or advise athletes. [...] ”( who provide support to those who produce primary services, “[...] manufacture sports equipment, broadcast games or advise athletes. [...] ”( ROCK, BASTOS, 2011: p.4). According to these concepts, they will be considered here as sports managers to those organizations, clubs or associations that are part of the first group mentioned. As sports organizations are essentially service providers, the influence of people on business results and relationships aimed at customer satisfaction is even more significant. In this case, the concept of service is adopted as an act or performance offered by one party to the other. Even if the service process is linked to a specific good, such as washing a vehicle, which must be taken into account for such service to occur satisfactorily, that is, the delivery of the car cleaned, sanitized and waxed, it is the performance of the employee who will perform the task, which performance is intangible (LOVELOCK, WRIGHT, 2001:p.5). With regard to physical activity, fights or martial arts, which is characterized by a service provision whose production process is essentially aimed at transforming people, attracting and retaining talent is paramount and should be considered a competitive advantage in view of the intensive increase in competition in this market today. In this way, an explanation will be made about what service management is, its relationship with people management and the indispensable support of information technology for this purpose.

**1. Theoretical framework:** Sports service management: its relationship with marketing, people management and information and communication technologies.

It is well known that the percentage share of services in the economy grows exponentially and still account for the majority of job vacancies and occupations offered. Even in the case of emerging economies, “service production has been growing rapidly and often represents half of the gross domestic product - GDP” (LOVELOCK, WIRTZ, HEMZO,2011: p.5). According to the Business & Fitness Portal, in an article about the Fight Market in Brazil (BASTOS, 2013) it is indicated that within the service sector, in the fitness market, considered a producer of sports services, the locus of the analysis of this article, there was an increase in the visibility of fights and martial arts. This phenomenon is related to millionaire

events sponsored by large companies linked to the UFC (Ultimate Fighting Championship), especially in Brazil. In this sense, the author makes an appeal to Brazilian businessmen, in the sense of opening their eyes to this market which is highly profitable and which, notably, presents itself as an extremely profitable investment opportunity.

The services cover a very wide range of activities and for this reason are extremely complex and difficult to classify. Thus, a relevant classification, which clarifies and guides the manager towards the most effective type of marketing strategy, people management and operations, is the process perspective. The nature of the service production process can be tangible or intangible and it can transform or process people (minds), goods and information. Regarding the tangible aspect in services, there may be actions that objectively impact people's bodies or physical goods. With regard to the intangible aspect of service provision, these impacts occur in people's minds or in their intangible assets, such as credibility, the brand. Adopt this epistemological principle, “[...LOVELOCK, WIRTZ, HEMZO, 2011:p.24). This means that different processes impose diversified marketing, operations and people management strategies, appropriate to the characteristics and specificities of the business. As in this article the intention is to discuss the performance management of student-athletes in the fitness market, more specifically in gyms, the analysis will have a cut in the specificities of people processing.

One of the main peculiarities of consumers who seek benefits in services that process people, is that they, necessarily, need to be prepared to cooperate with the operations process in which they are involved. In other words, whoever wants to lose weight, in addition to having a good workout adjusted to their characteristics and needs, also needs discipline, perseverance to follow an adequate diet for this purpose. It means that the final result of the service provision also depends a lot on the consumer's own performance. When understanding the practice of fighting and martial arts in gyms as a service provision, in view of the complexity of this sector, it is necessary to classify it for a better formulation of strategic principles for an efficient marketing, people and operations management.

First, it can be said that the practice of fighting and martial arts prosecute people, and has the following main characteristics:

- Customers do not obtain ownership of this service provision, as the result of this transaction process is intangible;
- The customer must visit the service factory and spend a good time in its facilities;

- There is greater involvement of customers in the production process. For the result to be achieved, such as losing weight or improving the performance of kicks, commitment and dedication is necessary;
- The level of interaction of the student-athlete team of which the client is part can contribute positively or negatively to the satisfaction of his individual goals, stimulating him even more to practice sports or discourage him.
- There is greater variability in the production process of this service, considering that the difficulty, skill, objective of each student-athlete are different;
- During the production of the service, it is more difficult to assess whether the work of the manager-manager is really good. The services can only be evaluated during or after the purchase, in addition, it is necessary to have confidence in the work of the professional.

In services that sue people and, especially in this case, when it comes to teaching fighting or martial arts, it takes a while to realize that there has actually been progress. The student-athlete must be willing to experiment, wait, allow time to evaluate the result of the practice. For this reason, the time factor is extremely relevant. It is precisely at this point that the importance of information technology is recognized, as undisputed support for decision making by the sports manager. In view of the importance of time and the evaluation of the effectiveness of the service provided by the client, the manager must prepare to efficiently record the entire history of the student-athlete's performance so that he can follow his evolution, from time to time, and finally being able to evaluate, significantly, results of service provision. The following are some analyzes of these technologies that interact with team management and the training of student-athletes.

### **1.1 Information and Communication Technologies and support for athletes' development.**

Information and Communication Technologies, called ICT's, have long been gaining ground in sports. The use of cutting-edge technological tools and equipment by athletes and coaches and also by communication vehicles has become more frequent in the practice and dissemination of sports. The search for high performance has led coaches and athletes to rely on ICTs to obtain, integrate and analyze efficiently and effectively, the information and resources necessary for decision making by the sports manager (Katz, 2003). According to the publication of the National Council for Technological Development (2013, p.88-89), these information technologies, geared to sports, reveal specific data that are used in evaluations of athletes to improve their training, in particular, and to improve the training methodology in

general. Evidence the technical, physical or tactical performance of an athlete or a team that can indicate the degree of relevance of a particular type of training and whether it is returning a satisfactory result. In the same way, it is possible to detect when an athlete's physical exhaustion warns of the need for more rest, as the software is supported by knowledge of Physiology, Exercise Biochemistry, Biomechanics, Nutrition and Genetics. Sports training has evolved a lot in recent years and Information and Communication Technologies can help to reconcile this knowledge, facilitating analyzes and projections. physical or tactical performance of an athlete or team that can indicate the degree of relevance of a particular type of training and whether it is returning a satisfactory result. In the same way, it is possible to detect when an athlete's physical exhaustion warns of the need for more rest, as the software is supported by knowledge of Physiology, Exercise Biochemistry, Biomechanics, Nutrition and Genetics. Sports training has evolved a lot in recent years and Information and Communication Technologies can help to reconcile this knowledge, facilitating analyzes and projections. physical or tactical performance of an athlete or team that can indicate the degree of relevance of a particular type of training and whether it is returning a satisfactory result. In the same way, it is possible to detect when an athlete's physical exhaustion warns of the need for more rest, as the software is backed by knowledge of Physiology, Exercise Biochemistry, Biomechanics, Nutrition and Genetics. Sports training has evolved a lot in recent years and Information and Communication Technologies can help to reconcile this knowledge, facilitating analyzes and projections. Exercise Biochemistry, Biomechanics, Nutrition and Genetics. Sports training has evolved a lot in recent years and Information and Communication Technologies can help to reconcile this knowledge, facilitating analyzes and projections. Exercise Biochemistry, Biomechanics, Nutrition and Genetics. Sports training has evolved a lot in recent years and Information and Communication Technologies can help to reconcile this knowledge, facilitating analyzes and projections.

Corroborating these statements, it is possible to indicate the existence of several works developed in masters and doctorates, in Brazilian universities, as is the case of the tool called PLUX Real-Time Sports Evaluation (SANTINHA, 2011: p.7). With it there is the possibility to monitor and, therefore, to evaluate an athlete in real time, especially because it was created with the purpose of responding to the needs of Sports professionals. This tool has as its main feature the ability to acquire, visualize, process and record physiological signals with the respective assessment of the athlete's performance in real time. This assessment, which can be performed based on heart rate and / or energy expenditure. Systems can be developed with the support of coaches, clubs, federations, private companies and universities, with different

degrees of sophistication and effectiveness, for different sports. The differences between them are mainly associated with the nature of the data that each one allows to collect and the forms of analysis available. The principle of this analysis is the recording of the actions taken by the athletes and their results. These actions are basic for each sport and are called fundamentals. They include, for example, kicking, passing and heading in football; serve, reception, attack and block in volleyball, etc. The principle of this analysis is the recording of the actions taken by the athletes and their results. These actions are basic for each sport and are called fundamentals. They include, for example, kicking, passing and heading in football; serve, reception, attack and block in volleyball, etc. The principle of this analysis is the recording of the actions taken by the athletes and their results. These actions are basic for each sport and are called fundamentals. They include, for example, kicking, passing and heading in football; serve, reception, attack and block in volleyball, etc.

In the case of the study to be described here, the intention is, in the future, from a greater detail of the daily training of the Bang Minas taekwondo team, in which its fundamentals will be known, to develop a management system for training athletes, performing adaptations and adjustments of what already exists in the market, respecting the specificities of the team, especially with regard to the methodological adjustments made by the manager, Mestre Noel, to his children's team. Another interesting example, also developed in a master's degree at the School of Physical Education and Sport at the University of São Paulo (2013), is a program, called FRAMI, a pioneer in Brazil, which assists in the technical-tactical study of combatants in Judo fights. This analysis, in addition to being faster in FRAMI, about fifteen minutes,

Another software available on the market aims to analyze the incidence of injuries and deviations in postures in Taekwondo athletes (TAMBORINDEGUY et.al., 2011). Ten volunteer male athletes participated in this test, who were part of the Santa Catarina team. In order to carry out the tests, in addition to questionnaires, some technological resources were used, such as digital photographic cameras that captured the athletes' images for postural evaluation in a software called SAPO. The studies concluded that for every 10 athletes 6 they felt some type of body discomfort after the competition or intense training session in the hip, thigh, knee, leg and / or ankle, and some mentioned that the discomfort was caused by physical effort, stretching exercises, blows or frequent training, and others who did not know how to define the causes. It was also found that 8 out of 10 athletes have already had some type of acute injury resulting from the practice of taekwondo, focusing mainly on the lower limbs, with the foot region being the most affected by sprain and fracture. Certainly, this information from these advanced technologies is fundamental to an efficient management of

training athletes in the martial arts, although, for the vast majority, there are many challenges to be overcome.

Lack of professionals with adequate training or undergoing training in physical education courses, without experience and management training, hinder the good performance of sports activities, in addition to restricting fundraising by other means, particularly those derived from government incentives. Another significant factor for a good or bad performance of training is the number of athletes trained. Training is almost always an individual issue. Sports performance is the sum of several factors that can vary from person to person, even if they achieve the same result in competition. That is why it is important to fully identify and mobilize the potential of each individual (BARBANTI, 1994).

However, there is an opportunity to use software and other technological resources for managing athletes in the martial arts modality, with regard to the individual monitoring of each athlete and, consequently, the progress of the entire team, supporting the coach in making decisions and assisting you in preparing your training. In addition to providing a data repository containing records, evolutionary history, physical and psychological assessments, among other information about athletes, giving the coach the necessary conditions for the proper development of his athletes and meeting the individual needs of each one. The trainer knowing the team better will be able to develop a more efficient and objective training plan,

## **2. CASE STUDY: The Bang Minas Team and its challenges**

In the city of Diamantina, in the upper Jequitinhonha, the BANG MINAS GERAIS team started its work in 2008, at the SPLASH academy, with only 6 students. At that time the objective was to increase and consolidate a team of taekwondo, Korean martial art and Olympic sport, whose name is: the path of the feet and hands in search of the perfection of oneself, through the body and the mind. Currently, the team has one hundred and one frequent students among children, youth and adults. All the dissemination and promotion of taekwondo carried out by the teacher and the academy, as a physical activity that stimulates discipline and self-control, attracted many parents interested in offering their children this type of reinforcement in education. Due to the curriculum of Mestre Noel, who has proven experience in training children's athletes, in mid-2011 there was a high demand for children between seven and twelve years old. In this case, it was necessary, at first, to separate the classes using a quantitative criterion, two classes in the morning and two in the afternoon.

In view of the number of frequent students, there was a need to divide the class into five groups, these children up to six years old, children up to eight years old, children aged two to twelve years old, youth and adult graduates and youth and adult beginners. There are exactly



twenty children up to six years old, forty up to twelve years old, twenty five up to seventeen years old and sixteen over eighteen years old. At the time of enrollment, a small diagnosis is made by the teacher in which the parents or adult students answer some questions such as: the objective with the modality and if they have health problems.

Based on these answers, respecting the age criterion, an appropriate time is sought for the student who should preferably be in a group with similar motivations, thus enabling the best training optimization. With this, it is hoped that individual goals will be achieved, and that collective training can also be a source of motivation and pleasure.

In the taekwondo modality, there are periodically exams of bands that are divided into beginners, intermediate and advanced, being expected, for each band, a certain development of maturity and group of skills. Especially for this study, the mentioned teacher adopted as a methodological criterion three groups of skills to be developed, which he called technical, conceptual and behavioral skills. Thus he clarified:

“[...] for technical skills, specific knowledge, according to the athlete's range or level, about kicks, punches and defenses is required. As for conceptual skills, knowledge of the history of the sport and its philosophy is expected. Finally, for behavioral skills, daily postures are expected such as respect for parents and the community in general, responsibility for their duties, discipline, self-control and perseverance. The more graduated the student is, a fact revealed by the band that he conquered, the more he will be charged with an example regarding these skills.» (TESTIMONY MASTER NOEL, 2013).

Therefore, its greatest challenge has been to monitor the development of each of these student-athletes, in view of the large number of practitioners, and the difficulty of maintaining dynamic and interactive records that quickly return to the student's evolutionary history. From this division, there is a need to seek improvement for each group, inserting their goals and identifying the best training strategy for them.

Having more than twenty years of experience in the sport, including eighteen years as a coach, Mestre Noel manages, through only subjective analyzes, to notice the existence of a progressive development of each group, with the identification of some talents, without, however, being able to accurately measure or qualify the size of that progress. All students need special attention, which means offering an individual diagnosis of their growth, in a detailed way, even so that it is possible to offer the opportunities due to the talents that are really identified as such. Upon reaching this stage, the Bang Minas team is faced with a

reality: how to manage all these student-athletes in order to develop them seeking excellence within the modality,

It is hoped, as already mentioned in the article, that the support of an information system suitable to this reality, can help in the process of improving that management. In Taekwondo children are considered as “children” up to twelve years old, “Junior” adolescents up to seventeen years old and “adults” above eighteen years old. The division of the so-called “GUB”, Korean expression for under black bands, for children up to twelve years old is: white, yellow, green, purple, blue, brown, red, red black and black band (BANG TAEKWONDO CLUB, 2008) . As each group of athletes has specificities that would not be able to be discussed and analyzed in the reduced space of this article, it was decided to perform a superficial demonstration of what would be the first stage of the development of a training management software for this purpose, without conditions for further details. So considering, in this article, only the child group of nine to twelve years of age and presented by age and GUB divisions, it is necessary to describe the criteria for technical, conceptual and behavioral assessments adopted by the Bang Minas team to support the planning of the system requirements to be developed.

Therefore, it will be necessary to identify the fundamentals used in the performance evaluation process adopted by Mestre Noel. It is important to note that the criteria for this group, as well as for the others, will be adapted by the master since there is no known bibliographic source that supports him at this time.

Technical, conceptual and behavioral criteria:

- **WHITE STRIPS: Technical criteria:** simple leg techniques; arm techniques, stopped on Korean basis AP KUBI, ARE MAKI, MONTONG MAKI AND ORGURL MAKI, all with the complement of BARO TIRIGUI; POOMSAE in Korean means a sequence as if it were a kind of imaginary struggle. Thus, for this band, the so-called POOMSAE SAJU AP THAGUI applies, standing with arms raised and legs together; SHIBON SOGUI: Sequences of leg bases in Korean. Conceptual criteria: what is TAEKWONDO, history of TAEKWONDO, spirit of TAEKWONDO and oath. Behavioral criteria: a questionnaire was adopted for this criterion, which must be given to the parent and the school, where they seek to contribute to the child's education. This tool is used in all ranges.
- **YELLOW BANDS:** Specific leg and hand techniques; POOMSAE: Taegurl Irl Jang accompanied by a monitor and SHIBON SOGUI; KIOPA: one of the elements of TAEKWONDO, understood as a form of rupture - jump upwards called TIMIO AP

THAGUI; Demonstration of racket fighting. Conceptual criteria: KIORUGUI competition rules (fight in Korean). Behavioral criteria: questionnaire.

- **ORANGE STRIPS:** Specific leg and hand techniques; POOMSAE: Taegurl IRL JANG, I JANG accompanied by monitors; KIOPA: jump up called TIMIO AP THAGUI; Demonstration of racket kicks. Conceptual criteria: KIORUGUI competition rules (fight in Korean). Behavioral criteria: questionnaire.

- **GREEN BANDS:** Specific hand and leg techniques; POOMSAE: TAEGURL I JANG and SAM JANG accompanied by a monitor; KIOPA: TIMIO YOP THAGUI without any obstacle; Non-contact fight against monitor. Conceptual criteria: chronological data of Brazilian taekwondo and general knowledge of the meaning of TAEGEUK SAM JANG. Behavioral criteria: questionnaire.

- **PURPLE STRIPS:** Specific hand and leg techniques; POOMSAE: TAEGURL SAN JANG and SA JANG; KIOPA: TIMIO YOP THAGUI in extension; Fight with contactless vest. Conceptual criteria: meaning of the band colors, meaning of POOMSAE, meaning of TAEGURL, and general knowledge and meaning of TAEGEUK SA JANG. Behavioral criteria: questionnaire.

- **BLUE BANDS:** Specific hand and leg techniques; POOMSAE: TAEGURL SA JANG and O JANG; KIOPA: TIMIO YOP THAGUI in height. Fight with contactless vest. Conceptual criteria: meaning of KUKKIWON and general knowledge and meaning of TAEGEUK O JANG. Behavioral criteria: questionnaire.

- **BROWN BAND:** Specific hand and leg techniques; POOMSAE: TAEGURL SAN JANG, SA JANG, O JANG and IUK JANG; KIOPA: MONTONG BARO TIRIGUI in wood; Fight with non-contact vest; Conceptual criteria: meaning of TAE KYON KWAN'S and general knowledge meaning of TAEGEUK IUK JANG. Behavioral criteria: questionnaire.

- **RED STRIPE:** Leg techniques: MITI (racket fight); POOMSAE: ALL PREVIOUS; KIOPA: jump with two targets and a break with hands; Fight with vest; Conceptual criteria: tchir JANG system. Behavioral criteria: questionnaire.

### **Expected Results and Final Considerations**

The training management software that will be developed should contribute to a better management of the individual performance of Taekwondo children athletes, as well as assist the coach in the training planning, considering the need diagnosed in the student athlete's performance. Physical assessments, changes in ranges, participation in championships,

everything will deserve registration, so that later reports can be generated with a well-defined history of each student's profile.

With this work, it is envisaged to create an opportunity to share experiences and anxieties regarding an ancient practice, extremely important for human development, but still so little known and valued by Brazilian society.

If the existing prejudices regarding the practice of martial arts were not enough, which is sometimes seen as a stimulator of violence and sometimes as an activity that masculinizes, the manager still has to face the market dynamics that, being in crisis, makes this business a one of the first to be cut from the list of consumers who see them as a “perfumery” practice, in view of other needs.

Therefore, the commitment of the manager also goes through the process of clarification with its consumers, the importance of the practice of martial art in the lives of their families, their children, and how much this is directly linked to the success they will have as human beings. in life.

Working to strengthen awareness of health, discipline, character and other characteristics developed in these activities, which contribute immensely to the development of a democratic and sustainable nation is undoubtedly a challenge. That is why professionalization is so important, research with the discovery of valuable knowledge, which can contribute even more to the evolution of human performance. And in this process, technology has been a valuable ally.

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