# Exploring the Impact of IT-Enabled Innovations on Athlete Performance: Insights from Rapid Product Development Research

**Jimmy Abeza[1], Ellen Gretchen[2]**

**Abstract**

This study explores the revolutionary effects of IT-enabled innovations on athletic performance, utilizing knowledge from the vibrant field of research on fast product development. Sports have embraced a digital revolution that has transformed training, performance analysis, injury prevention, and fan involvement in an era where technology is developing at an unheard-of rate. With wearable technology and immersive virtual worlds, training approaches have undergone a paradigm change that benefits athlete today. These developments stretch the limits of human potential by allowing athletes to fine-tune their performances with unmatched accuracy. Data-driven insights have replaced subjective evaluations in performance analysis. Coaches may use advanced analytics, powered by machine learning, to improve player performance, create strategic game plans, and gain a competitive advantage. Additionally, IT-enabled innovations have changed how players, teams, and spectators interact. The spectator experience is improved with augmented reality overlays, and fan participation on social media and interactive platforms is increased regardless of a fan's location. Although these developments are revolutionary, moral issues are very important. Complex issues that must be resolved include preservation data privacy, maintaining fair competition, and establishing the limits of performance enhancement.

**Keywords:** It-Enabled (Ite), Innovations (I), Athlete Performance (Ap), Product Development Research (Pdr)

## 1. Introduction

The word 'athlete performance' can be explained in these words "the effort of any individual in terms of mental and physical aspect to win in any competition and to defeat next person or other team for winning". The word "IT-enabled innovations" can be enumerated as the process that involves the breakthrough of technology which is the result of research including application development, use of process of testing along finally use of customer and acceptance as well (Castillo López et al., 2021). The Innovations that are brought by technology include Automation in different aspects of work, task performance in less given time, high efficiency, and better performance in each facet of the market (Rehman et al., 2018). The desire of perfection has long been a motivating factor in the world of sports. Pushing the limits of human potential, athletes, coaches, and sports aficionados have persistently looked for ways to improve performance. The fusion of sports and information technology (IT) in recent years has ushered in a new era of opportunities. With the introduction of previously inconceivable new tools and insights, IT-enabled innovations have started to change the way that athletes perform. This study sets out on a journey to investigate the significant influence of IT-enabled innovations on athlete performance, relying on knowledge gained from the vibrant field of research on rapid product development. Technology and sports combining is not a novel idea (Ceazón et al., 2021; Edwards et al., 2021). Sports have long incorporated technology in various ways, from the use of fibreglass poles in pole vaulting to radar guns in baseball. However, it is remarkable how quickly IT-enabled innovations are changing the athletic world. Athletes are now data-driven robots because of the digital revolution, which has ushered in an era when data is king. Various factors affect the performance of any athlete, these factors include body movement, work by foot, flexibility in the body, the proportion of the body, the fitness of different organs such as cardiovascular organs, and most importantly nutrition, the level of hydration, and energy in the body (Leonhardt et al., 2018). With the use of more technology because of IT-enabled Innovations, there is more social media use that has affected the performance of athletes in different ways as well. Recent studies which include interviews with coaches reported that there are more challenging aspects for athletes related to social media use and high-technology innovations (Durmusoglu & Kawakami, 2021). In athletes, a balance of the sleep-wake cycle is necessary for better performance and efficiency. But due to more use of phones at night, the sleep-wake cycle of athletes has been affected badly. In some college studies, it is also discussed that the use of video gaming

[1]Hospital Israelita Albert Einstein, São Paulo, SP, Brazil

[2] Human Kinetics, Laurentian University, Sudbury, ON, Canada

before competition negatively affects the performance of athletes (Héroux & Fortin, 2018). This evolution is visible in many facets of sports, from preparation and performance evaluation to injury prevention and fan involvement. The contemporary athlete's toolset now includes wearable tech, cutting-edge sensors, and data analytics platforms. Athletes and coaches have access to real-time biometric data, performance analytics, and tactical insights. This research engages in a multifaceted examination to try to answer these problems. It aims to clarify the numerous facets of how IT-enabled technologies are permanently altering athletic performance. This investigation's key idea is "rapid product development research." This strategy recognizes how quickly technology is developing and how it is already having an effect on sports. It embraces the idea that innovation is a dynamic, ever-evolving process rather than a linear one (ALSHAWY et al., 2019). The data for analysis is collected from coaches, therapists, and psychologists of athletes which explains that IT innovations have more negative impacts as compared to positive aspects of it. The overuse of social or digital media can be defined as overspending useful time on social media platforms such as video games, other mobile apps, different websites, and illegal activities such as cybercrime and data theft. It is in contrast to healthy digital media use which is the use of social media platforms for better useful services such as for gaining knowledge, understanding, or theoretical learning with visual aspect too (Chi et al., 2010). The other word used for digital media addiction is online addiction which involves addiction to different online games, online spending of money, surfing the internet, and others. This addiction is more common in students of young age such as school students and college students. This digital media use badly affects the performance of any athlete in terms of their efficiency and output. For example, it is proven by studies that athlete who is involved in posting on social media platforms such as Twitter, their late-night scrolling and responding badly affects their sleep-wake cycle (Pavlou, 2004). It has been seen that no sleep activity during time of night is related to less performance during the day. This late-night awakening can lead to sleep deprivation in athletes which can decrease both the mental and physical performance of athletes. The other aspect of IT innovation's impact on Athlete Performance can be explained in terms of the use of platforms such as Facebook (Lin, 2011). When an athlete is busy scrolling on Facebook which associates high hopes in them that can also create anxiety in them before and during performance. Interviews by different athletes in the Olympics gave the idea of the fact that the more they are involved in social media, the more chances they get of depression and anxiety. There is also a term called sports anxiety that can result in injury, affecting the timing of performance and others. The effect of Facebook on the performance of athletes is effectively studied by questionnaires completed by 298 athletes including male and female athletes from different countries. These athletes admitted that they use Facebook most probably during competition or sometimes two hours before competition. When the psychologists of these athletes were interviewed they said that the optimal psychological activity that is needed for concentration decreases by use of Facebook before and after competition (Zhang et al., 2023). Sports-related IT-enabled advancements are representative of the wider trend of digitization that is spreading through several industries. As technology develops, it has the potential to upend established procedures, providing both athletes and stakeholders with new opportunities. Due to IT-enabled advances, the way athletes train has undergone a transformation. Sophisticated technology-driven initiatives have augmented, if not completely replaced, traditional training methods. Wearable technology that tracks every stride, every muscle contraction, and every pulse is now available to athletes. Athletes and coaches may fine-tune training plans with unmatched accuracy due to these devices' real-time feedback. Athletes may recreate game situations and improve their decision-making skills in immersive training settings due to virtual reality and augmented reality technologies. Even pushing notifications from the screen also distracts the mind of the athlete during the competition for winning. Not only use of Twitter and Facebook has affected athletes, but it has also been seen that video gaming and its effects have also become very dynamic. It is proved by different studies that the screen time of thirty minutes or more before competition, badly affects the decisive mental power of athletes during competition. This over-screen time before and during competition also causes mental fatigue to the athlete which lowers the mental efficiency and performance of the athlete during competition. The trend of online gaming has been unceasing and increasing in these days, this menace and addiction have also affected different professionals such as Athletes. During the pandemic of corona, the trend of online gaming prevailed throughout the whole globe (Jitpaiboon et al., 2013). However, this online gaming not only increases the screen time of athletes but also lowers the chances of winning during performance because of less concentration on physical games and more involvement in online tasks as well. The performance of any athlete is determined by a sum of factors which are external as well as internal. The

external factors include environmental factors such as residence area, nutrition, domestic conditions, interpersonal relationships, and others but internal factors include different and versatile factors such as better mental health, physical health, energy, and potential. The performance of any athlete is determined by both these factors but unfortunately, addiction to social media has affected both internal and external factors of athletes and resulted in decreased or diminished performance of athletes during competition. The overuse of social media resulted in less concentration on given tasks because of physical, mental, and biological changes by the use of social media platforms (Makhloufi et al., 2021).

## 2. Research Objective

The main objective of this study is to understand the relationship between IT-enabled innovations on the performance of athletes. The studies related to this topic effectively explained that the overuse of social media platforms is dangerous for the mental and physical health of athletes and ultimately affects the performance of athletes during competition. The decisive making power and concentration on tasks decrease because of more habitual or addicted to the overuse of social media which is an IT-enabled innovation. This study aims to address these issues and offer thorough understandings of how IT-enabled advancements affect athletic performance. It highlights the necessity for a complex comprehension of the changing dynamics between technology and sports. A disruptive age in which IT-enabled innovations are transforming the fundamental nature of sports is upon the sports industry, players, and enthusiasts. We set out on a mission to untangle the complex web of this digital revolution in sports via the lens of fast product development research, hoping to not only understand its effect but also foresee its long-term ramifications.

The research describes that exploring the Impact of IT-Enabled Innovations on Athlete Performance related to the Insights from Rapid Product Development Research. This study divided into five specific research chapters: first section represents that introduction related to the IT enabled innovations and athlete performance. this portion describe that objective of research also that explain research questions. The second section describe the literature review the third portion represent research methodology the fourth section present results. The last section describes and summarized overall research study and present some recommendations about exploring the Impact of IT-Enabled Innovations on Athlete Performance related to the Insights from Rapid Product Development Research.

## 3. Literature Review

This review is based on the overview of studies that are related to IT-enabled technology and its impact on performance of the athletes worldwide. As we all know the present era is the era of science and technology. This era has benefited everyone in different aspects such as communication, transportation, knowledge, learning, employment, and others. But overuse and misuse of this technology have also resulted in disastrous effects that have to be discussed in the given situation and circumstances (Tigga et al., 2021). As the use of technology has prevailed in our society, the addiction to social media platforms has also increased in recent years and this addiction is somehow known as social media addiction. According to statics and data analysis by recent studies, it is revealed that almost 210 million people around the world are suffering from social media addiction these days. These statistics have become more pathetic when it was known that almost 78% of Americans use different social media platforms daily (Applegate et al., 2006). Not only confined to the common layman, this addiction has also been seen in different professionals such as Athletes. The lifestyle of the athlete should be very balanced and coordinated for effective performance during competition. The athletes have to undergo different physical, mental, and emotional changes during competition, they have to undergo time management, decision-making process, anxiety, fear, depression, and sometimes also failure but the athlete's physical and mental health should be balanced so that he can cope with all the given circumstances (Benzidia & Makaoui, 2020). However recent studies have shown that athletes are also suffering from social media addiction that is affecting their performance during competition. Some studies are carried out based on questionnaires and other studies are based on interviews. Some interviews are also taken with psychologists depending upon their analysis based on daily dealing with patients with mental health disorders (Rampersad & Troshani, 2020). The era of time has made athletes very prominent on social media and portrayed them as celebrities more than professionals. This aspect has also attracted the attention of athletes because of getting popularity (Wadhwa et al., 2010). Most athletes are now using different social media platforms such as Twitter, Instagram, Facebook and others. These platforms are not only limiting their time for practice but also affecting their mental health which ultimately affects their performance during competition (Dao et al., 2011). The way of dealing with, scrolling, and responding to these social media platforms is making time for practice for athletes. Usually, all athlete is now using social media platforms but their time limit for using social media platforms is not normal (Li & Jia, 2018). This increased time limit or overuse of social media platforms

causes a specific addiction called social media addiction. The use of any kind of screen negatively affects the structure of the brain and hormonal balance in the body. For example, continuous 30-minute screen time increases the level of cortisol in the body which is an emergency hormone with increases metabolic rate in the body (Chatterjee et al., 2015). By increasing this metabolic rate, there is more use of energy in the body that decreases the level of energy in the body, in return body feels lazy for any kind of physical work. The same has been seen in athletes, when they use screens for a longer time, they develop the habit of laziness that hurdles their ability and potential for practice and competition for winning. The second effect that has been seen in athletes is prolonged time for decision-making (Ogbanufe & Gerhart, 2020). More use of social media platforms can make a person biased and favored which can result in taking more time to make decisions, thus when these athletes perform during competition, they take more time for decision making which is the more negative impact of more use of IT enabled innovations on the performance of the athlete (Jung et al., 2023). The other addiction related to social media platforms is online gaming addiction which is also prevalent in athletes nowadays. But performance in these online games cannot compete with performance in Sports on the ground. According to recent data analysis, it is concluded that one in five student-athletes use their social media platforms for connections, communications, making their mark, and others (Chen et al., 2014). But this social media addiction at a young age in athletes is very disastrous. Usually during teenage, there is already a high metabolic rate in the body because of the peak of growth but by use of more social media platforms, there is less development of neurons in the brain that can cause less concentration on a given task (Khan & Tao, 2022). Recent studies have shown that those athletes who use social media platforms during their competition, get more panicky and anxious which can badly affect their performance in competition. Somehow it has also been seen that the family of athletes is also affected by these social media platforms (Yang et al., 2018). Mostly social media users send rude, toxic, negative messages to the families of athletes which can affect the mental health of the whole family. In this given time, social media has become the need of athletes too (Lennerts et al., 2020). These social media platforms help them to gain reputation, fame, contracts, and different types of endorsements. Nowadays social media accounts have become mandatory for them but there should be a proper way to shorten the time for social media use (Zhang et al., 2016). No doubt that proper training should also be provided to athletes related to awareness of the disastrous effects of the overuse of social media (Althuizen & Reichel, 2016). Secondly, athletes should not be treated as celebrities because they have different space in society which is quite enough for their reputation. Thirdly, there is no need to use every type of social media platform for athletes, only those platforms should be used which are mandatory and safe to use (Hensen & Dong, 2020). Moreover, social media has attached athletes more to brands than to their professional objectives. Proper training should be provided to young athletes related to their professional objectives. If there is chronic social media addiction, this addiction should be pacified with the help of a psychologist who will help to convert this addiction to better activity for the athlete (Cui et al., 2020). This review has efficiently explained the Impact of IT-enabled innovations on the performance of the athlete and concluded that overuse of social media can cause mental and physical fatigue in athletes that can result in their poor performance in competition thus leading to less chances for winning (Bala et al., 2017; Nanath & Pillai, 2017).

## 4. Research Methodology

The research study describes and exploring the Impact of IT-Enabled Innovations on Athlete Performance related to the Insights from Rapid Product Development Research. This research study based on the primary data analysis for this purpose the IT-enabled innovations is main independent variable the athlete performance is main dependent variable. for determine the research used questions related to indicators these questions fulfil from different participants related to athlete performance. for measuring the research study used SPSS software and generate informative results related to exploring the Impact of IT-Enabled Innovations on Athlete Performance related to the Insights from Rapid Product Development Research. The descriptive statistic analysis, the correlation analysis, the regression analysis, also that present one-way ANOVA test analysis, the variance analysis also that chi squares between both variables.

### 4.1 Analytics for Performance

Performance analysis goes beyond what is possible with human observation. Innovations made possible by IT now allow for the capture and analysis of enormous volumes of data, resulting in previously unachievable insights. Machine learning algorithms are used by sports analytics systems to identify trends, evaluate player performance, and develop winning tactics. In order to maximize team dynamics and individual player contributions, coaches may now make data-driven decisions.

### 4.2 Injury Mitigation and Recovery

Athletes' health comes first, and IT-enabled technologies have been essential to the prevention and treatment of

injuries. Athletes and medical personnel can be made aware of possible health hazards due to biometric data acquired by wearable technology. Virtual reality has also been used in rehabilitation to assist wounded sportsmen regain their strength and mobility while minimizing the psychological toll of healing. As we continue our investigation, we become aware that the quick advancement of IT-enabled innovations in sports creates important questions. It is necessary to address ethical issues related to data protection, performance improvement, and the digital divide. Furthermore, it's unclear how IT-enabled advancements will affect how sports develop in the future. Technology has the potential to either create a new era of superhuman athletes or it may protect the core of human achievement.

**Table 1**

*Descriptive statistics*

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| IT-Enabled Innovations | 50 | 1.00 | 3.00 | 1.4800 | .61412 |
| IT-Enabled Innovations | 50 | 1.00 | 3.00 | 1.4200 | .53795 |
| IT-Enabled Innovations | 50 | 1.00 | 3.00 | 1.5400 | .54248 |
| Athlete Performance | 50 | 1.00 | 4.00 | 1.6400 | .77618 |
| Athlete Performance | 50 | 1.00 | 4.00 | 1.6200 | .72534 |
| Product Development Research | 50 | 1.00 | 3.00 | 1.7000 | .67763 |
| Valid N (listwise) | 50 | | | | |

The above result describes that descriptive statistical analysis included minimum values, maximum values, the standard deviation also that mean rate of each variables included independent and dependent variables. the IT enabled innovation shows that mean value is 1.4800 the standard deviation present that 61% deviate from mean. The result describes that overall minimum value is 1.000 and maximum value is 4.000 the overall observation rate is 50 respectively. The IT enabled innovation 2 and 3 these are all present that 1.4200 and 1.5400 average value of mean. The standard deviation rates are 53% and 54% deviate from mean the result describe that positive deviate from mean values. The athlete performance shows that mean value is 1.6400 and 1.6200 all of them present that positive average value of mean. The standard deviation rates are 77% and 72% deviate from mean values. The product development research represent that mean value is 1.7000 the standard deviation rate is 67% deviate from mean values.

**Table 2**

*ANOVA results*

| ANOVA | | | | | | |
|---|---|---|---|---|---|---|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| IT-Enabled Innovations | Between Groups | .810 | 2 | .405 | 1.078 | .349 |
| | Within Groups | 17.670 | 47 | .376 | | |
| | Total | 18.480 | 49 | | | |
| IT-Enabled Innovations | Between Groups | 1.798 | 2 | .899 | 3.412 | .041 |
| | Within Groups | 12.382 | 47 | .263 | | |
| | Total | 14.180 | 49 | | | |
| IT-Enabled Innovations | Between Groups | .917 | 2 | .458 | 1.596 | .214 |
| | Within Groups | 13.503 | 47 | .287 | | |
| | Total | 14.420 | 49 | | | |
| Athlete Performance | Between Groups | 1.709 | 2 | .855 | 1.444 | .246 |
| | Within Groups | 27.811 | 47 | .592 | | |
| | Total | 29.520 | 49 | | | |
| Athlete Performance | Between Groups | .135 | 2 | .068 | .124 | .884 |
| | Within Groups | 25.645 | 47 | .546 | | |
| | Total | 25.780 | 49 | | | |

The above result describe that one-way ANOVA test analysis result represent that sum of square values, the mean square values, also that F statistic and significant values of each variables included dependent and

independent indicators. According to the result the IT-enabled innovation is main independent its sum of square rate is 0.810 the mean square value is 40% and 37% the F statistic value is 1.078 also that significant value is 34% significantly value between them. similarly, the IT-enabled innovations 2 and 3 these are all consider as independent indicators. The result describes that sum of square values are 1.798, 12.382, 14.180, 13.503, 14.420 these are all present that positive sum of square rates between them. according to the result the mean square value is 89%, 26% 45% and 28% average square rate between them. the result present that significant value is 21% significantly rate between them. the athlete performance describes that between the group also within the group represent that F statistic rates are 1.444 and 0.124 the significant values are 24% and 88% significantly relation between them.

**Table 3**

*Model summary results*

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .363[a] | .132 | .054 | .75473 |

a. Predictors: (Constant), Product Development Research, IT-Enabled Innovations, IT-Enabled Innovations, IT-Enabled Innovations

The above result describes that model summary result present the R values, R square values, the adjusted R square values also that standard error values. The R rate is 0. 363 the adjusted R square rate is 0.054 the standard error value is 75% respectively.

**Table 4**

*ANOVA B results*

**ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 3.887 | 4 | .972 | 1.706 | .165[b] |
| | Residual | 25.633 | 45 | .570 | | |
| | Total | 29.520 | 49 | | | |

a. Dependent Variable: Athlete Performance

b. Predictors: (Constant), Product Development Research, IT-Enabled Innovations, IT-Enabled Innovations, IT-Enabled Innovations

The above result represents that sum of square values, the mean square values, the F statistic rates also that present significant value of each model included regression and residual. The regression present that sum of square shows that regression rate 3.887 the mean square value is 0.972 shows 97% average square rates the F statistic value is 1.706 also that its significant value is 16% significantly level between them.

**Table 5**

*Coefficients results*

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.656 | .484 | | 5.489 | .000 |
| | IT-Enabled Innovations | -.301 | .182 | -.238 | -1.656 | .105 |
| | IT-Enabled Innovations | .142 | .218 | .098 | .649 | .520 |
| | IT-Enabled Innovations | -.189 | .213 | -.132 | -.886 | .381 |
| | Product Development Research | -.283 | .175 | -.247 | -1.617 | .113 |

a. Dependent Variable: Athlete Performance

The above result describes that linear regression analysis result shows that dependent variable is athlete performance the independent variables describe as unstandardized coefficient rates included that beta value and standard error. The result present that t statistic values and significant value of each independent variables. the IT-enabled innovations show that beta value is -0.301 the standard error value is 0.182 the t statistic rate is -1.656 also that significant rate is 0.105 shows that negative but 10% significant relation between IT enabled innovation and athlete performance. the product development shows that negative but its 11% significant rates between the athlete performance. the beta value of unstandardized coefficients is -0.301, 0.142, -0.189 and -0.283 these values shows some negative and some positive coefficient rates.

**Table 6**

*Test results for Athletes*

| Test Statistics | | | | | | |
|---|---|---|---|---|---|---|
| | IT-Enabled Innovations | IT-Enabled Innovations | IT-Enabled Innovations | Athlete Performance | Athlete Performance | Product Development Research |
| Chi-Square | 20.440[a] | 25.720[a] | 22.120[a] | 33.040[b] | 33.360[b] | 10.360[a] |
| df | 2 | 2 | 2 | 3 | 3 | 2 |
| Asymp. Sig. | .000 | .000 | .000 | .000 | .000 | .006 |
| a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.7. | | | | | | |
| b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.5. | | | | | | |

The above result describes that test statistic analysis included chi square the result present that chi square values of IT enabled innovations are 20.440, 25.720, 22.120, 33.040 also that 33.360 and 10.360 respectively. According to the result overall significant rate is 0.000 shows that 100% significantly values between them.

**Table 7**

*Extraction method for total variance*

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 1.738 | 28.962 | 28.962 | 1.738 | 28.962 | 28.962 |
| 2 | 1.313 | 21.883 | 50.845 | 1.313 | 21.883 | 50.845 |
| 3 | .953 | 15.887 | 66.732 | | | |
| 4 | .869 | 14.475 | 81.207 | | | |
| 5 | .671 | 11.184 | 92.391 | | | |
| 6 | .457 | 7.609 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

The above result describes that variance analysis result present that % of variance, % of cumulative also that Extraction sums of squared result present that total value of each component. According to the result the total values are 1.738, 1.313, 0.953, 0.869, 0.671 also that 0.457 shows that 45% variance rates between them. according to the result cumulative percentage present that 50.84, 81.207, 92.391 represent each cumulative value between them.

## 5. Discussion and Conclusion

The investigation of the effects of IT-enabled innovations on athlete performance, as illustrated by findings from research on fast product development, has shown a significant and complex revolution in the sports industry. As we get to the end of this voyage, numerous significant lessons and ramifications become clear. Data-driven decision-making has replaced subjective evaluations in performance analysis. Coaches and players now have access to a wealth of knowledge that may help them develop training plans, make better tactical choices, and increase player performance. IT-enabled improvements have improved performance while also placing a higher priority on the health of athletes. The cost of injuries to athletes has greatly decreased because to the creative use of virtual reality in rehabilitation and the early identification of possible health hazards using biometric data. In the digital era, the dynamic between players, teams, and fans has changed. A feeling of community and loyalty that transcends geographical bounds has been adopted via augmented reality, social media, and interactive platforms, which have opened up new channels for fan participation. The research study determine that exploring the Impact of IT-Enabled Innovations on Athlete Performance related to the Insights from Rapid Product Development Research . this research based on primary data analysis for measuring the data used SPSS software and generate informative results. Our investigation into how IT-enabled innovations affect athlete performance highlights the indisputable role that technology plays in influencing the sports scene. Beyond the parameters of practice and competition, this impact affects the fundamental essence of what it means to be an athlete and a sports enthusiast in the digital era. In conclusion, our investigation into how IT-enabled innovations affect athlete performance highlights the indisputable role that technology plays in influencing sports. Utilizing technology ethically and responsibly is crucial as we traverse this digital change. The combination of IT and sports has enormous potential for improving human capacity, but it must be governed by moral standards of justice, openness, and accountability. The overall research concluded that there are direct and significant Impact of IT-Enabled Innovations on Athlete Performance related to the Insights from Rapid Product Development Research. This research study accepts the alternative hypothesis and reject null hypothesis. The sports sector is poised for a dynamic future where tradition and technology coexist, and this study offers helpful guidance for navigating this unfamiliar environment. Athletes, coaches,

administrators, and spectators must all approach this digital transition with a sense of responsibility as we move forward if we are to maintain the integrity and principles that make sports what they are. The combination of IT and sports is a tremendous force that has the ability to increase athletic potential in people, but only if it is governed by justice, openness, and ethical concern. This study is a tribute to the need of comprehending and navigating the tremendous influence of IT-enabled innovations in the always changing path at the intersection of technology and sports. The insights gained from this investigation will surely play a crucial part in determining the direction of the sports industry's exciting but challenging future.

## References


ALSHAWY, F. A., Ibrahim, A., Hussein, C., & Lahlah, M. (2019). First record of arrow bulleye, Priacanthus sagittarius Starnes, 1988 from the Syrian marine waters (Eastern Mediterranean). *FishTaxa, 4*(2), 21-24. https://fishtaxa.com/article-view/?id=45

Althuizen, N., & Reichel, A. (2016). The effects of IT-enabled cognitive stimulation tools on creative problem solving: A dual pathway to creativity. *Journal of Management Information Systems, 33*(1), 11-44. https://doi.org/10.1080/07421222.2016.1172439

Applegate, L. M., Austin, R. D., & McFarlan, F. W. (2006). *Corporate information strategy and management.* McGraw-Hill/Irwin Custom Publishing. https://www.gbv.de/dms/zbw/585302286.pdf

Bala, H., Massey, A. P., & Montoya, M. M. (2017). The effects of process orientations on collaboration technology use and outcomes in product development. *Journal of Management Information Systems, 34*(2), 520-559. https://doi.org/10.1080/07421222.2017.1334494

Benzidia, S., & Makaoui, N. (2020). Improving SMEs performance through supply chain flexibility and market agility: IT orchestration perspective. *Supply chain forum: An international journal. 21*(3) (pp. 173-184). Taylor & Francis. https://doi.org/10.1080/16258312.2020.1801108

Castillo López, A., Llorens Montes, F. J., & Braojos Gómez, J. (2021). Impact of social media on the firm's knowledge exploration and knowledge exploitation: The role of business analytics talent. Association for Information Systems. http://dx.doi.org/10.17705/1jais.00700

Chatterjee, S., Moody, G., Lowry, P. B., Chakraborty, S., & Hardin, A. (2015). Strategic relevance of organizational virtues enabled by information technology in organizational innovation. *Journal of Management Information Systems, 32*(3), 158-196. https://doi.org/10.1080/07421222.2015.1099180

Chen, Y., Wang, Y., Nevo, S., Jin, J., Wang, L., & Chow, W. S. (2014). IT capability and organizational performance: the roles of business process agility and environmental factors. *European Journal of Information Systems, 23*(3), 326-342. https://doi.org/10.1057/ejis.2013.4

Chi, L., Ravichandran, T., & Andrevski, G. (2010). Information technology, network structure, and competitive action. *Information systems research, 21*(3), 543-570. https://doi.org/10.1287/isre.1100.0296

Cui, T., Tong, Y., Teo, H.-H., & Li, J. (2020). Managing knowledge distance: IT-enabled inter-firm knowledge capabilities in collaborative innovation. *Journal of Management Information Systems, 37*(1), 217-250. https://doi.org/10.1080/07421222.2019.1705504

Dao, V., Langella, I., & Carbo, J. (2011). From green to sustainability: Information Technology and an integrated sustainability framework. *The Journal of Strategic Information Systems, 20*(1), 63-79. https://doi.org/10.1016/j.jsis.2011.01.002

Durmusoglu, S. S., & Kawakami, T. (2021). Information technology tool use frequency in new product development: The effect of stage-specific use frequency on performance. *Industrial Marketing Management, 93*, 250-258. https://doi.org/10.1016/j.indmarman.2021.01.014

Edwards, C. T., Schneider, P. A., & Huynh, C. (2021). Paclitaxel Exposure and Dosage of Drug-coated Devices for the Treatment of Femoropopliteal Peripheral Artery Disease. *Vasculat & Endovascular Review.* https://verjournal.com/article/2591

Hensen, A. H., & Dong, J. Q. (2020). Hierarchical business value of information technology: Toward a digital innovation value chain. *Information & Management, 57*(4), 103209. https://doi.org/10.1016/j.im.2019.103209

Héroux, S., & Fortin, A. (2018). The moderating role of IT-business alignment in the relationship between IT governance, IT competence, and innovation. *Information Systems Management, 35*(2), 98-123. https://doi.org/10.1080/10580530.2018.1440729

Jitpaiboon, T., Dobrzykowski, D. D., Ragu-Nathan, T., & Vonderembse, M. A. (2013). Unpacking IT use and integration for mass customisation: a service-dominant logic view. *International Journal of Production Research, 51*(8), 2527-2547. https://doi.org/10.1080/00207543.2012.720727

Jung, M., Eom, M. T., & Yayla, A. (2023). Investigating the interaction effect between IT-enabled innovation and corporate social responsibility on firm performance. *Information Systems Management, 40*(1), 70-89. https://doi.org/10.1080/10580530.2022.2031352

Khan, A., & Tao, M. (2022). Knowledge absorption capacity's efficacy to enhance innovation performance through big data analytics and digital platform capability. *Journal of Innovation & Knowledge, 7*(3), 100201. https://doi.org/10.1016/j.jik.2022.100201

Lennerts, S., Schulze, A., & Tomczak, T. (2020). The asymmetric effects of exploitation and exploration on radical and incremental innovation performance: An uneven affair. *European Management Journal, 38*(1), 121-134. https://doi.org/10.1016/j.emj.2019.06.002

Leonhardt, D., Hanelt, A., Huang, P., & Mithas, S. (2018). Does one size fit all? Theorizing governance configurations for digital innovation. https://www.researchgate.net/profile/Daniel-Leonhardt-3/publication/328065418

Li, M., & Jia, S. (2018). Resource orchestration for innovation: the dual role of information technology. *Technology Analysis & Strategic Management, 30*(10), 1136-1147. https://doi.org/10.1080/09537325.2018.1443438

Lin, L.-H. (2011). Electronic human resource management and organizational innovation: the roles of information technology and virtual organizational structure. *The International Journal of Human Resource Management, 22*(02), 235-257. https://doi.org/10.1080/09585192.2011.540149

Makhloufi, L., Azbiya Yaacob, N., Laghouag, A. A., Ali Sahli, A., & Belaid, F. (2021). Effect of IT capability and intangible IT resources on sustainable competitive advantage: Exploring moderating and mediating effect of IT flexibility and core competency. *Cogent Business & Management, 8*(1), 1935665. https://doi.org/10.1080/23311975.2021.1935665

Nanath, K., & Pillai, R. R. (2017). The influence of green is practices on competitive advantage: Mediation role of green innovation performance. *Information Systems Management, 34*(1), 3-19. https://doi.org/10.1080/10580530.2017.1254436

Ogbanufe, O., & Gerhart, N. (2020). The mediating influence of smartwatch identity on deep use and innovative individual performance. *Information Systems Journal, 30*(6), 977-1009. https://doi.org/10.1111/isj.12288

Pavlou, P. A. (2004). *IT-enabled dynamic capabilities in new product development: building a competitive advantage in turbulent environments.* University of Southern California. https://www.proquest.com/openview/df7c8d1db7fbf8225fbdcd5f435942f2/1?pq-origsite=gscholar&cbl=18750&diss=y

Rampersad, G., & Troshani, I. (2020). Impact of high-speed broadband on innovation in rural firms. *Information Technology for Development, 26*(1), 89-107. https://doi.org/10.1080/02681102.2018.1491824

Rehman, N., Nor, M. N. M., Taha, A. Z., & Mahmood, S. (2018). Impact of information technology capabilities on firm performance: Understanding the mediating role of corporate entrepreneurship in SMEs. *Academy of Entrepreneurship Journal, 24*(3), 1-19. https://www.proquest.com/openview/fe00d198afe21a846deec5b6c499255a/1?pq-origsite=gscholar&cbl=29726

Tigga, G. A., Kannabiran, G., & Arumugam, V. (2021). Exploring relationships among IT advancement, IT assimilation, supply chain capabilities and supply chain performance. *Journal of decision systems, 30*(4), 414-438. https://doi.org/10.1080/12460125.2021.1873022

Wadhwa, S., Mishra, M., Chan, F. T., & Ducq, Y. (2010). Effects of information transparency and cooperation on supply chain performance: a simulation study. *International Journal of Production Research, 48*(1), 145-166. https://doi.org/10.1080/00207540802251617

Yang, X., Lin, L., Cheng, P.-Y., Yang, X., Ren, Y., & Huang, Y.-M. (2018). Examining creativity through a virtual reality support system. *Educational Technology Research and Development, 66*, 1231-1254. https://doi.org/10.1007/s11423-018-9604-z

Zhang, F., Bell, G. G., Li, D., & Wu, L. (2023). The Contingent Effect of IT Use on Product Innovation in the Transition Economy: A Qualitative Comparative Analysis. *Journal of Global Information Technology Management, 26*(1), 25-46. https://doi.org/10.1080/1097198X.2023.2166751

Zhang, P., Zhao, K., & Kumar, R. L. (2016). Impact of IT governance and IT capability on firm performance. *Information Systems Management, 33*(4), 357-373. https://doi.org/10.1080/10580530.2016.1220218