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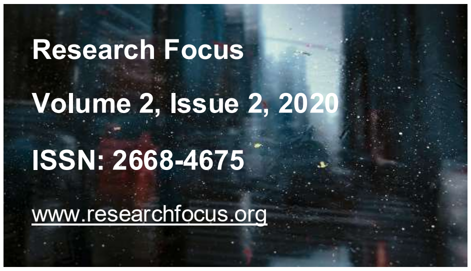

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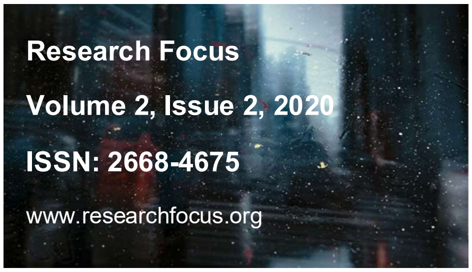

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Sponsorship and investment in the professional sport area

Léo BUREL

Romanian American University, Romania

Abstract

Each year multinationals spend millions of US Dollars in sport sponsorship and sport deals with league, franchises, club or athletes. Sponsorship shows to be an effective marketing and communication method which allow to raise awareness and a good image of the brand. Indeed, sport is followed all around the world and generate huge amount of money. It is also an important source of income for sport franchise, club and athlete. With those agreements and sponsors deals, each part of the deals seems to be winning something. In this paper, those different elements will be explained and demonstrate with example that shows sport sponsorship bring a win-win situation for the sponsors and the sponsored.

Key words: Sport Sponsorship, Sport revenue, commercial revenue, merchandising revenue, brand awareness, brand image, sportive figure

Introduction

Each year the professional sport area gathers a huge audience with sport league and cup or through big event (like the Super bowl, the Olympic Games or the Football World Cup), and generate billions of US dollars. Those amounts are generated through different ways as match day revenue (mainly the ticket sale), broadcasting revenue (earned from TV right), or also through commercial revenue with merchandising, partnerships and sponsorship (Essays, UK., 2018; Olaniyi Olayiwola, 2016). In 2018, the value of the global sport market was estimated to be higher than 488 billion of US dollars (Wood, 2019). In fact, millions of people are watching and following and supporting a professional sport and sport team. In the most famous and followed sport, we can find the US football though the NFL league and the basketball though NBA, which are two huge sources of income in North America (in 2018, the website Statista evaluated the merchandising market to 14.5 billion of US Dollar (Gough, 2019)). But in Europe and worldwide, the Football (or soccer) is the most popular and played sport.

By the number of sport followers in the world, sports became the more interesting and efficient way for the brands and sponsors to communicate and reach a large consumer target. Indeed, in every sport team shirt, league name (like for example the Barclays Premier League in England, the Liga Santander in Spain or the Ligue 1 Conforama in France) or even Sport Stadium like the Arsenal's football club stadium called the Emirates Stadium; sponsors and partnerships are everywhere and see by everyone (Essays, UK., 2018). As you probably guess, there are different type of sport sponsorship. We can take on sponsorship agreements between brands and sport team for the supply of kit, event sponsorship and athlete sponsorship.

With sponsorships, some well-known Athlete, also considered as superstar like Ronaldo and Messi in soccer or Lebron James in basketball, earned millions of dollars each year only due to agreements with big brands and sponsors (Forbes, 2019). In this situation, we can ask us the following questions: Why multinational and brands spend such huge amount of money in the sport area and sponsorship? What are the advantages and the benefit for them? To answer those questions, we will see that sponsorship is a good way for brands to improve their brand awareness and their image by spreading the company value. We will see that the sponsorship is a marketing tool which is very financially profitable for the sponsors but also for the sponsored, which bring a win-win situation for both part of the agreement.

Brand awareness

One of the main goals of the sponsorship for a brand/firm is to increase his brand awareness and to obtain a wider visibility. (Zimmer Radio & Marketing Group, 2016; Olaniyi Olayiwola, 2016) According to the website Investopedia: "Brand awareness is a marketing term that describes the degree of consumer recognition of a product by its name" (M. KOPP, 2019) In other words, the aim of creating brand awareness is to create a link in the consumer mind with the brand: with this promotional method, the consumer will be able to recognize the brand or the company. A lot of firms use sport sponsorship to increase their visibility and increase their brand awareness (Olaniyi Olayiwola, 2016). To illustrate this, I use a famous example with sponsorships agreements between soccer teams and airlines companies (Scott, 2018).

In fact, airlines companies are present in the European soccer sponsorship, an area which count one of the most important number of followers in the world. There is some example of sponsorship like between Qatar Airways and the FC Barcelona, Etihad Airways and Manchester City, but the most present airline company in the European soccer is Fly Emirates with several agreements with some of the best teams in the world like the Real Madrid, the PSG, Arsenal, Benfica and the AC Milan (Graham & Bumgarner, 2015). Fly Emirates is one of the first airline company who started to sponsor soccer team with the football team of Chelsea in 2001 and Arsenal in 2004 into the UK football or with the Italian team AC Milan; and overall, in soccer with the FIFA world cup in 2003. Even nowadays, Arsenal still have an agreement with the giant from airline for the shirt sponsor and the naming of the stadium: The Emirates Stadium (Scott, 2018).

This agreement was estimated to be worth €226 million (Scott, 2018). The multinational choose to create long term relationship in order to increase their brand awareness, they choose to invest in the European football for two main reason: the first one is that the company provide a lot of offer starting from or arriving to Europe, the second one is that football, as said earlier, is the most followed and the most popular sport in the world which allow the firm to catch a really wide customer base (or spectator who could become future customer).

This is an efficient way to communicate and to advertise the brand. In the same way, we have also seen big company as Coca Cola sponsoring worldwide events like the Olympics Games or the Football World Cup, broadcasted on TV all around the world, to catch a worldwide audience, create an important brand awareness and make the company known by everyone.

Image and company's value

By creating a relation or a collaboration between two companies (or in our case between a company and an athlete, sport team or sport event), the image of the company is influenced in the consumer mind. Different studies show that sponsorship was used to influence the image of the sponsor (Olaniyi Olayiwola, 2016). In the case of the sport, we use to associate sport with youth, energy, good health, training and surpassing yourself which attract a lot. On the whole, a lot of company use sport to create an association between the different attributes quoted above and their own image in the consumer mind.

In the past, we already saw company like the giant Nike, use sponsorship to improve their image and assure their values. Example with the Kaepernick case between 2018 and 2019. Colin Kaepernick was a US football quarterback who had a big media coverage after kneeling during the national anthem, before each game, to protest against racial injustice and the president Trump. He was part of the big campaign of Nike for the thirty years anniversary of the famous motto “Just do it”. After that he was boycotted by the NFL and the football franchise, but Nike continue to support him even after that (Mullen, 2018; Belson, 2018). With this, Nike made a big move, showing his strength and his social implication in the US country. Moreover, shortly afterwards, according to Business Insider, more than 15000 investors put money into Nike share with a price tag which increased by 15% meanwhile (Delventhal, Buy Nike on 'Stroke of Genius' Kaepernick Campaign: Canaccord, 2019). This example shows perfectly the strength of sponsorship in the mind of the consumer and that operation like this, can influence and make the image of the sponsor even better.

Financial benefit

A win-win agreement

In this last part, I will show the financial benefit of an agreement between the sponsor and the sponsored with two examples: With an agreement between a sport team and a sponsor and with an agreement between an athlete and a sponsor for each example, I will introduce the benefit for each part and explain them.

Sponsorship of a football team

As said earlier, the income for a sport team (or sport club) are diverse. They can be match day revenue by ticket sale, broadcasting revenue with the TV rights and commercial revenue from merchandising and sponsorships. Below you can find the valuation breakdown of the global income of the French football team: PSG (Paris Saint Germain). This graph shows clearly the importance of the commercial revenue (sponsors and merchandising) which represent around 46% of the PSG’s global revenue (Forbes, 2019).

This first example shows the importance for big sport team to have relations and sponsors, which are a big source of income. But with this second example: an agreement about the kit supply between Nike and the Liverpool FC, we will identify a specific sponsorship, and the way that the sponsors make a financial profit.

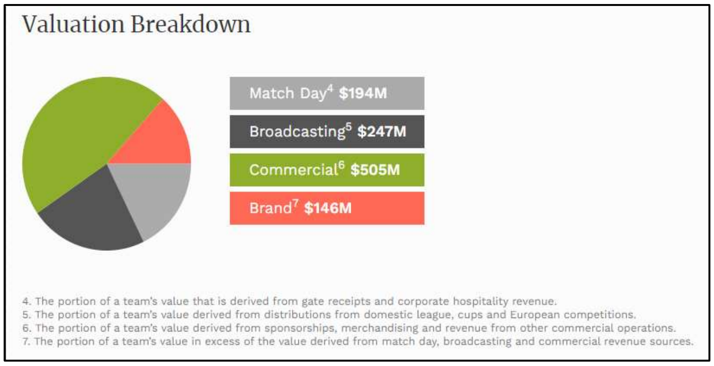

Figure 1. Sponsorship of a football team

(Source: Forbes, PSG Valuation Breakdown)

Indeed, the two parts just sign an agreement which means that Nike will be the official kit supplier of the last Champions League winner (2018/2019) starting from 2020. This contract was sign for several years, even if the amount is not communicating for the moment, the partnership could worth several million (some newspaper like the BBC talk about 30 millions € per years), added by bonus and a percentage on the merchandising, close to 20% on all the derivative product (Sponsoring.fr, 2020). However, it's Nike who will perceive most of the merchandising revenue which is very interesting for the swoosh brand. Liverpool is the last winner of the Champions League and currently in a good way to win the Barclays Premiere League, which means that the shirt and derivate product sales will certainly explode. During the 2018/2019 season, the club sold around 1 925 000 shirts (Foot inside, 2019), the average price is 75£ the shirt (Liverpool FC, s.d.), which means the kit supplier of Liverpool won around 115 500 000£ last season (1 925 000 *75 *80%). So, this type of partnership worth a lot for both parts.

Sponsorship of a sportive figure

Each year, the newspaper Forbes draw a list of the 100 Highest-Paid Athlete in the world (Forbes, 2019). In 2019, the first three athletes of this list were three soccer players: Messi, Cristiano Ronaldo and Neymar. In this list we have information about the way they earn so much money: by their salary but also with endorsement. According to the Cambridge Dictionary, an endorsement is "the fact of a famous person appearing in an advertisement saying that they use and like a product", in other words, saying that this players earn money with endorsement means that they have contract and are sponsored by brand or company which bring them an income (Cambridge Dictionary, s.d.; Banton, 2019). Through those agreement with brand, Leo Messi won around $35 million in 2019, Ronaldo around $44 million, and in other sport like tennis: Roger Federer earned $86 million, or $53 million for the basketball superstar Lebron James, and this only with endorsement (Forbes, 2019). The sponsorships are an important source of revenue for those athletes who, with this contract, hit the jackpot.

With an example, we will see that they are good reasons on the financial point, in addition to the brand awareness and visibility, for big company to invest in sport figure. This example is one of the last hugest contracts in the world: the lifetime contract between Nike and the football player Cristiano Ronaldo (Badenhausen, 2016; Delventhal, What Nike's $1 Billion Ronaldo Deal Means, 2019). Cristiano Ronaldo is a marketing tool by himself, indeed after being the most followed person on Facebook, he became the first personality to overcome the 200 million followers in Instagram with a very strong community (Leigton, 2020). According to Forbes, for each sponsored post in Instagram, the superstar earns almost $1 million, which is a huge amount of money (Leigton, 2020). Since 2003, Nike started a deal with the player, due to his evolution and his great performances which allow him to construct a legendary career, his community and popularity never stopped to grow. Indeed, his numbers of fans has grown of 262 million on different platform and social network between his first Nike’s deal and 2016 (Delventhal, What Nike's $1 Billion Ronaldo Deal Means, 2019). That’s why Nike offer him a new deal in 2016. This lifetime deal should worth around $1 billion (Badenhausen, 2016; Delventhal, What Nike's $1 Billion Ronaldo Deal Means, 2019). In sport, only few athletes like Michael Jordan and Lebron James with Nike or Leo Messi with Adidas have a lifetime contract with a brand. The interest in Nike (and other brand) with figures like Ronaldo, is their high visibility. Indeed, a report from Hookit, a company specialized in analysis of sponsorship which measures brand’s media value, reveals that the visibility and presence of the Portuguese player on his different social media (Twitter, Instagram and of course Facebook) produce nearly $474 million in value for the American multinational in only one year. With an income like this, the lifetime deal with Ronaldo is fully profitable to Nike (Delventhal, What Nike's $1 Billion Ronaldo Deal Means, 2019). Each year Nike earns around $2 billion revenue only with football (footwear, shirt...), that explain his strong implication and the important number of sponsorships, relationships and business deals with athletes and teams in the football area.

With this example, it’s easier to understand why big company invests huge amount of money in sponsorships and deals with very famous Athlete, due to their exposition and community, it’s an efficient way to communicate and advertise their product and their brand. But it’s also a good opportunity for those superstar, hence the win-win situation between the two parts of the sponsors deal.

Conclusion

Through those different parts, we saw that sponsorship in sport is very beneficial for the firm and brand who invest in it. It’s more than a product placement, it’s a marketing and advertisement tool which allow companies to improve their brand awareness, their image and also to communicate about their values and their product. We saw in different example that it’s a manner to influence the customer’s mind about their opinion on the brand. The sport area is also a perfect area to invest due to the values generated by the sport but also by the important exposition through big events, cups and league which bring the hugest worldwide audience, or via sport team and sport superstar with an important visibility and a huge community. Moreover, we saw that the relations and deals between brand and sport team or athlete are profitable for each part of the agreement. At the financial level, those sponsorship are a very huge source of income for the sport franchise and sport athlete: for example, on a global Ronaldo’s revenue in 2019, the endorsement and sponsorship represent nearly 40% of his income ($44 million with endorsement against a global income of $109 million (Forbes, 2019)). In a way, athlete trade their image and their communication strength against an income, which is profitable for both parts, because of the big advertisement for the brand and the financial income which are generated.

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Main factors that affect employee retention at call centers

Radu M. COSMA

Romanian-American University, Romania

Abstract

Employee turnover is becoming increasingly high in call centers and customer support centers, with many employees joining as a fist job and a start in their career, later finding better job opportunities. In order to improve employee retention, it is important to address the root causes of employee resignations, but just as important to investigate the main factors that keep employees loyal. This paper aims to examine these two factors, as well as possible strategies for increasing employee retention.

Keywords: Strategies, Career path, Employee retention, Turnover rate

Introduction

As business and services evolve, the job complexity and requirements in call centers and support service centers are slowly increasing, making it harder for employers to find suitable candidates, and all the more important to maintain employee turnover rates at a reasonable level. This is a complex process that requires Managers and Human Resources to cooperate and develop strategies that will ensure business operations.

The increased difficulty in finding qualified candidates is caused by changing demographics, new work values, volatile economy, and global competition. Together, these factors make it one of the most difficult activities for organizations to recruit new employees. Managers and human resources find that traditional ways of recruiting agents, by online advertisements and job fairs, are not as effective.

A high rate of employee turnover in can increase expenses, disrupt activities, and cause damage the organization's success. In spite the value of handling turnover effectively, many retention attempts are focused on inaccurate or unreliable information, standardized best practices that don't correlate, or managerial gut instinct at odds with empirical evidence (Allen & Bryant, 2012, p. 12).

Definitions

Retention is defined as the rate of employees who remain in the organization.

Turnover is the opposite of retention, and it relates to the rate of employees who leave the organization for any reason (Phillips & Connell, 2003, p. 2).

Employee turnover, by standard definition, classifies a voluntary leave as a separation of the employee from the organization, and does not include promotions, transfers, and any other internal adjustments. (Hom, Allen, & Griffeth, 2020, p. 3)

Retention of employees and turnover of employees go hand in hand, but it is necessary to assess them separately. Most organizations make the mistake of calculating employee turnover and then presume that the retention rate is the opposite figure, but this is not necessarily an effective calculation process. (Tephillah Vasantham & Swarnalatha, 2016, p. 16)

Why employees leave?

By knowing the causes for which workers quit, companies will be able to properly support their current staff, and in the future, they will be able to affect their decisions.

The workplace turnover is categorized in two general types: voluntary and involuntary.

A research by Leadership IQ showed that 47 percent of high-performing individuals are aggressively searching for other jobs, while 44 percent are searching passively (Murphy & Burgio-Murphy, 2006, p. 16).

Involuntary turnover usually involves dismissals, layoffs, and forced retirements. Luckily, most call centers and customer support service centers are not greatly affected by involuntary turnover rates as they are by voluntary turnover.

Call center employees do not leave because they lack the qualifications or expertise to do their tasks; they leave primarily because they are not motivated and challenged by the role, lack the personality traits to be successful, or are dissatisfied with the atmosphere inside the organization (Petouhoff, 2001, p. 29).

Almost always, the withdrawal cycle is triggered by the reduced fulfillment and dedication, which involves thoughts of leaving in pursuit of more desirable alternatives.

As circumstances change over time during the career of an employee, the degree to which a person fits into the working environment may also change (Blackwell, 2017, p. 458).

If well conducted, exit interviews will offer a valuable insight for why workers leave. It is well known that when interviewers ask departing workers, "Why are you leaving?", many responders don't want to say the entire truth. They would rather answer “good opportunity” or “better salary” in order to maintain a bridge of communication with their former employer, whose references may be valuable in the future. (Branham, 2005, p. 3).

Employers usually give standard responses because they are afraid of being reprimanded or endangering any potential future references. The most common reasons workers leave are higher wages, better hours and more prospects. Such traditional responses to departure also reflect a much broader problem that workers can look into further. Employers can get more reliable and quantifiable results by asking specific questions and even using a impartial third-party company to perform the interview.

Contrary to what many companies assume, workers frequently leave because of management interactions and/or employee care, and not wages, as this is often a reason that workers feel uncomfortable voicing explicitly to their employer. Diagnosis of retention is a fast-benchmarking tool that measures risks that can help determine what impacts employee satisfaction, productivity and engagement.

What makes employees stay?

Equally important to understand why workers remain in a company is to understand why workers want to quit.

The extent to which the personal priorities, desires, expectations, and preferences of an employee complement those of the workplace (person – job fit) and company (person – company fit) influences the magnitude and consistency of the job experience of the employee and the relationship between employee and the organization (Blackwell, 2017, p. 456).

The latest research suggests that as employees participate in their professional and community life, they develop a web of connections and relationships (Tephillah Vasantham & Swarnalatha, 2016, p. 23). These interactions inspire employees to become more integrated in their jobs; and quitting their job would mean breaking or reorganizing these social networks. The more employees are integrated inside a company, the less likely they are to leave. Moreover, the degree to which workers experience compatibility with their colleagues in the workplace, the less chance they will seek other employment opportunities.

An organization can determine what makes employees loyal by engaging top performers in internal communications. An on-going dialogue will help to take the pulse of the company's work environment and the impact on top performing employees.

What are the best strategies for employee retention?

Good control of employee retention focuses mainly on those categories of workers you manage whose resignations are the most disruptive from the point of view of the company (Taylor, 2002, p. 12). The loss of a mediocre worker in one of those categories can be much more damaging to the company than the loss of an exceptional employee from another group.

This implies that employee retention initiatives should be aimed at these high-risk categories, rather than at those with the highest turnover rates. The goal is to start by defining which categories of workers you really need to keep in the company. This can be systematically established by calculating the financial impact of every voluntary resignation. The next phase is to find out what is causing workplace turnover for certain employees in particular. The final step is to begin implementing management strategies which have a good chance of increasing retention rates.

Many of the things needed in order to keep employees engaged don't involve spending much money (Tephillah Vasantham & Swarnalatha, 2016, p. 16). This is just about being honest and actually having empathy for the employee. By far the most important thing is to be accessible for employees and to behave genuinely.

Support in professional development. The best thing you can do for morale is to give workers a consistent path to success. Employee engagement is the reciprocal relationship between the company and an individual, in which the company helps the employee achieve his capacity, while the employee helps the organization meet its objectives and goals. (Kelleher, 2014, p. 4).

Employee engagement results in decreased absenteeism and turnover, as well as improved productivity and quality. It isn't enough just to make the business managers think about engagement. You need to incorporate advocates of engagement in the workforce.

Identifying the best workers as ambassadors of your engagement is crucial to creating an organizational culture of engagement.

Conduct stays interviews. While exit interviews are great for identifying why employees quit, an even better information source identifies what keeps employees loyal to the organization. Ask questions such as: What is it that makes you stay at this company? What could make you resign? How would you change, if you could, your role in the company? Would you change something about management?

Many managers are afraid to conduct such interviews due to what might surface as a result. It is a common thing to be scared of, but the knowledge gained is invaluable. Ask yourself not what happens if current employees say something bad about management. Instead, ask what happens if they don’t say anything, and later they leave.

Studies also suggest that workplace satisfaction is one of the best indicators of turnover (Petouhoff, 2001, p. 29). In other words, workers who acknowledge being the most unhappy with their jobs are those who are most likely to resign.

During the recruiting process, one approach for minimizing call center employee turnover is to determine candidates whose motivation and personality traits are compatible with those identified with longer tenure on the job. If there is a good match between the candidate and the job, less absenteeism and tardiness, and greater retention of employees are likely to occur.

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Exoskeleton suits

Marina GHIONEA STAN

Romanian-American University, Romania

Abstract

The present paper shows briefly the benefits of exoskeletons imagined especially for soldiers to acquire superhuman features, and a selection of the existing models on the market and prototypes that didn`t make it on for production, mostly in the United States of America. With the help of an exoskeleton a normal human can become something like a robot, and the super suit can actually increase life support, it helps with carrying weights for long periods of time and protects the user from getting hurt - like a shield.

Keywords: army project, defense, robot, shell, technology

Introduction

The United States Army is continuously exploring technologies to protect soldiers from injuries and enhance their strength and endurance with the so-called “exoskeletons”. There is a special exoskeleton program for which defense specialists are collaborating with private exoskeleton developers to create for “superhuman” soldiers.

The “super suits” ware inspired by medical science, where the patients are helped to overcome their deficiencies and can walk again. For soldiers - these suits can improve running, carrying heavier objects, as well as increasing endurance in harsh field conditions, and allowing factory workers to carry heavy loads.

Exoskeletons

Exoskeletons were imagined a long time ago in sci-fi movies like “Iron Man”, “Aliens” or “Edge of tomorrow” but today they are becoming more present than ever, mostly for protecting and helping people to overcome human body`s limitations (Best, 2019) (Mayfield, 2019) (Peck, 2020).

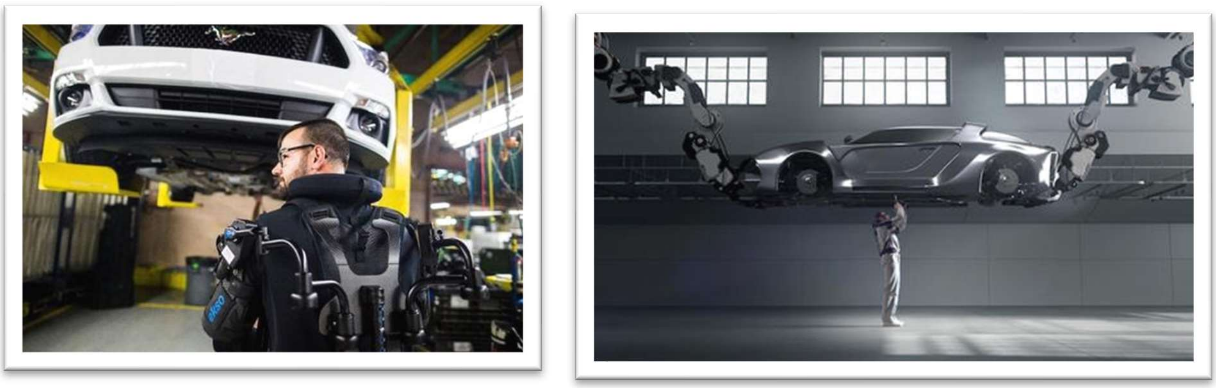
These suits are mostly produced in the United States, but China is keeping up by developing its own exoskeleton equipment part for military purposes, part for the aging population that needs assistance, especially for walking (Peck, 2020) (Albert Esquenazi, 2017).

There have been described two types of skeletons-suits: the ones that have a motor and the one without a motor –called “passive”. A very important feature of a passive exoskeleton is the fact that it can relieve the weight of the load carried to protect the human body from physical stress, while the motored one is used to enhance the worker`s power (Best, 2019) (Angela Boynton, 2017) (Wang, 2018).

Figure 1. Dynamic weight distribution

(Angela Boynton, 2017)

In the aviation and vehicle branch, many of the big company workers are now using exo-suits in production factories such as Ford, BMW, Toyota, and Boeing. Hyundai has its own exoskeleton program developing the VEX (Wearable Vest Exoskeleton). Meanwhile, General Motors and NASA are developing a super glove that can increase the grip when lifting heavier tools (Best, 2019) (Keller, 2019) (Szymkowski, 2019).



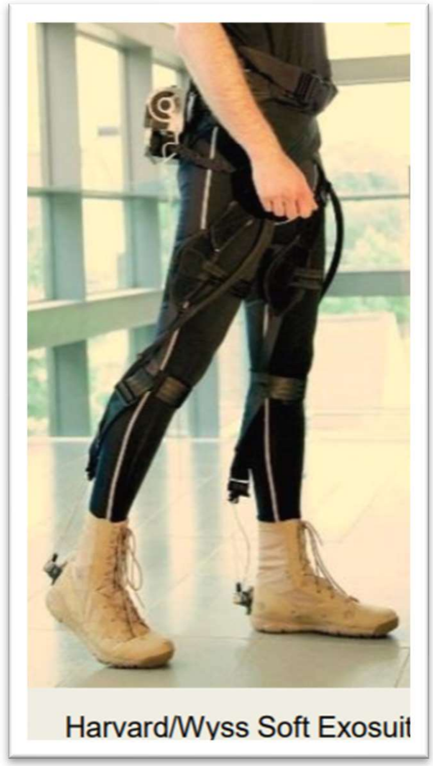
Ford`s EksoVests from Ekso Bionics (Best, 2019)

The VEX of Hyundai (Best, 2019)

Figure 2. Evo suits

Rian Whitton, a senior analyst at ABI Research, predicts that “in the short term that passive suits will be the main bulk of exoskeleton deployments, and that the industry is another 12 to 18 months away from seeing suits rolled out at in their thousands and tens of thousands” (Best, 2019).

Like Best wrote in 2019 “*It's clear that the era of the exoskeleton has begun*” (Best, 2019).



(Husseini, 2019) (Angela Boynton, 2017)

Figure 3. The Wyss Exosuit by DARPA

They developed a very light, multi-joint softshell, with textile components alongside special technologies that can-do individual calculations to determine what reinforcement is needed based on movement dynamic (Husseini, 2019) (Wang, 2018).

One of the biggest developers of the suits is Lockheed Martin – with the awarded exoskeleton The Onyx. Annually, Lockheed Martin secures large budgets from the US Department of Defense for developing and testing constantly new features for the perfect exoskeleton suit to protect the soldiers and improve their abilities and safety.

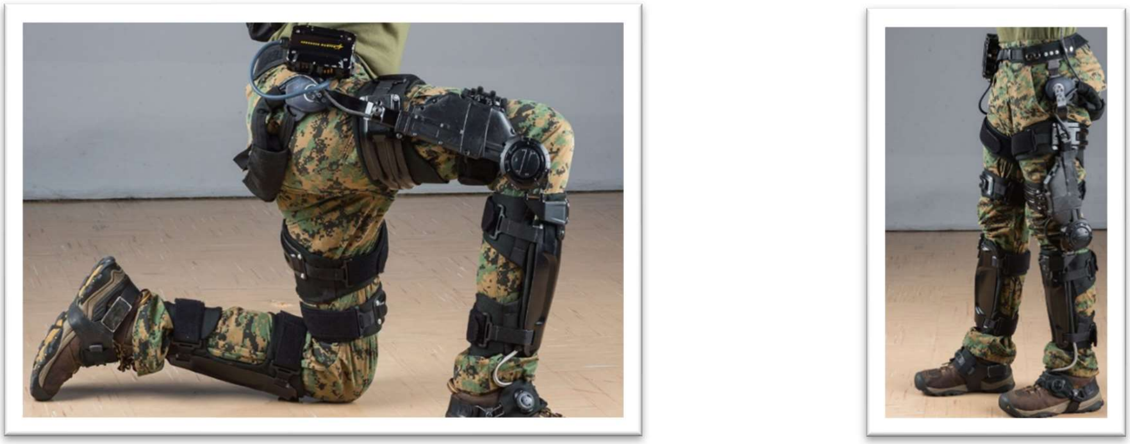


Figure 4. The Onyx by Lockheed Martin

(Source: (www.lockheedmartin.com, 2020))

According to program manager Keith Maxwell, with Lockheed Martin, “innovative human/machine technologies like ONYX can improve human performance, decrease injury and reduce fatigue to help soldiers accomplish physically demanding tasks” (Husseini, 2019)

The Onyx has sensors for everything: motion angle, speed, direction, and an inside computer that analyze the data acquired from these sensors, that deliver “the right torque at the right time to assist knee flexion and extension” (www.lockheedmartin.com, 2020). It can reduce the muscle and joint required energy for crossing rough terrain, climbing stairs, or going on a ramp, which helps the soldier to have more stamina (Husseini, 2019) (Martin, 2019) (Best, 2019) (www.lockheedmartin.com, 2020) (Keller, 2019) (Wang, 2018).

Figure 5. Exo-booth by Delphi

(Husseini, 2019)

Another awarded piece of an exoskeleton is the Delphi exo-booth, which was designed to support the ankle. It uses FlexSea technology that helps to increase the speed and simplify the electronic part of the “super-booth”, it helps with movement, provides network infrastructure for flexible joint exoskeletons and contains tools for acquiring data.

The exo-booth is very lightweight and comfortable and can be easily integrated into a soldier's standard equipment (Husseini, 2019) (Best, 2019).

(Husseini, 2019)

(Angela Boynton, 2017)

Figure 6. HULC (Human Universal Load Carrier) produced by EKSO/Lockheed Martin

Another super-suit from Lockheed Martin is the universal load carrier can help a man lift weights of 90 kg and carry them with no effort from the user side. Soldiers can have an average speed up to 11 km/h for long periods of time and a top speed of 16 km/h but only for a limited amount of time. A soldier can pull off and wrap the suit in less than 30 sec. It has attached sensors for heat and cold so that it can change the functionality depending on the body temperature, and also it is like a shield (Husseini, 2019) (Keller, 2019).

Figure 7. XOS2 produced by Raytheon/Sarcos

(Source: (Husseini, 2019))

XOS2 produced by Raytheon/Sarcos is one of the few powered (motored) suits on the market and has great potential. It uses hydraulic technology that allows a person to lift weights to 17 times his body mass, break through more than 7 cm of wood, and carry over 90 kg for long intervals of time. The user can walk or run in the suit and even climb stairs, or kick a ball (Husseini, 2019) (Best, 2019) (Keller, 2019).

Figure 8. TALOS by USSOCOM

(Source: (Husseini, 2019))

The Special Operation Center in the US developed in 2013 a new concept for exoskeletons (TALOS), and carried it on for a year, but fi in the end the program was interrupted because of low funding and problems caused by how to power a 300 kg suit. SOCOM company (designed the armor to expand the mobility and the strength of the human user, the TALOS could lift the survivability of its user due to the antiballistic full body shield, that offered a better vision and had such amount of sensors that offers the soldier the chance to access hi-tech displays and communication (Husseini, 2019) (Best, 2019) (Peck, 2020) (Wang, 2018).

Figure 9. OX by Australia DSTO

(Source: (Husseini, 2019))

The Defense Organization from Australia developed a soft suit that reduced the required effort of walking soldiers. This suit uses two special cables that are used in aircraft technology or brakes of bicycles to put part of the soldier's backpack to be taken over by the ground support. It weighs only 3 kg, but the cables are preventing free movement of the soldier's legs (Husseini, 2019) (Mayfield, 2019) (Keller, 2019).

There are various studies made for developing the perfect lightweight exo-suit, for example the one for the design and testing of a autonomous leg exo-booth that reduces the metabolic energy required for walking long distances with heavy load, involving many passionate people for the job. All research for exoskeletons is very demanding in terms of funding, participants' knowledge, the right methodology, volunteers, and so on. All of these things have repercussions over the final price of the product, which should be minimum, but companies can`t afford to decrease the quality and safety, striving to find the right balance, the perfect benefit-risk ratio (Luke M Mooney, 2014) (C.Billinge, 2018) (Mannc, 2016).

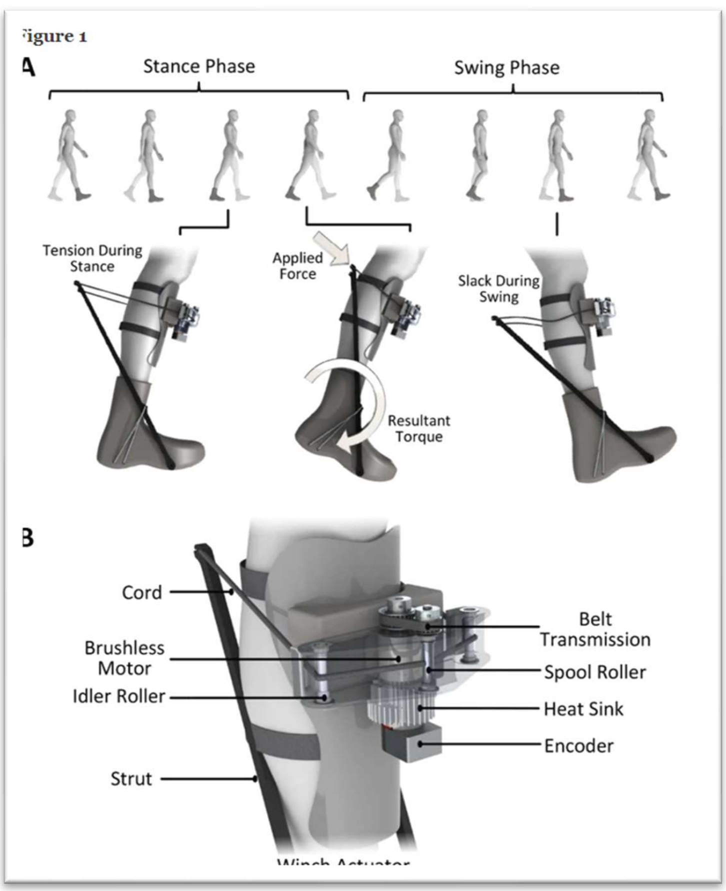


Figure 10. Sketches for developing ancle exoskeleton

(Source: (Luke M Mooney, 2014))

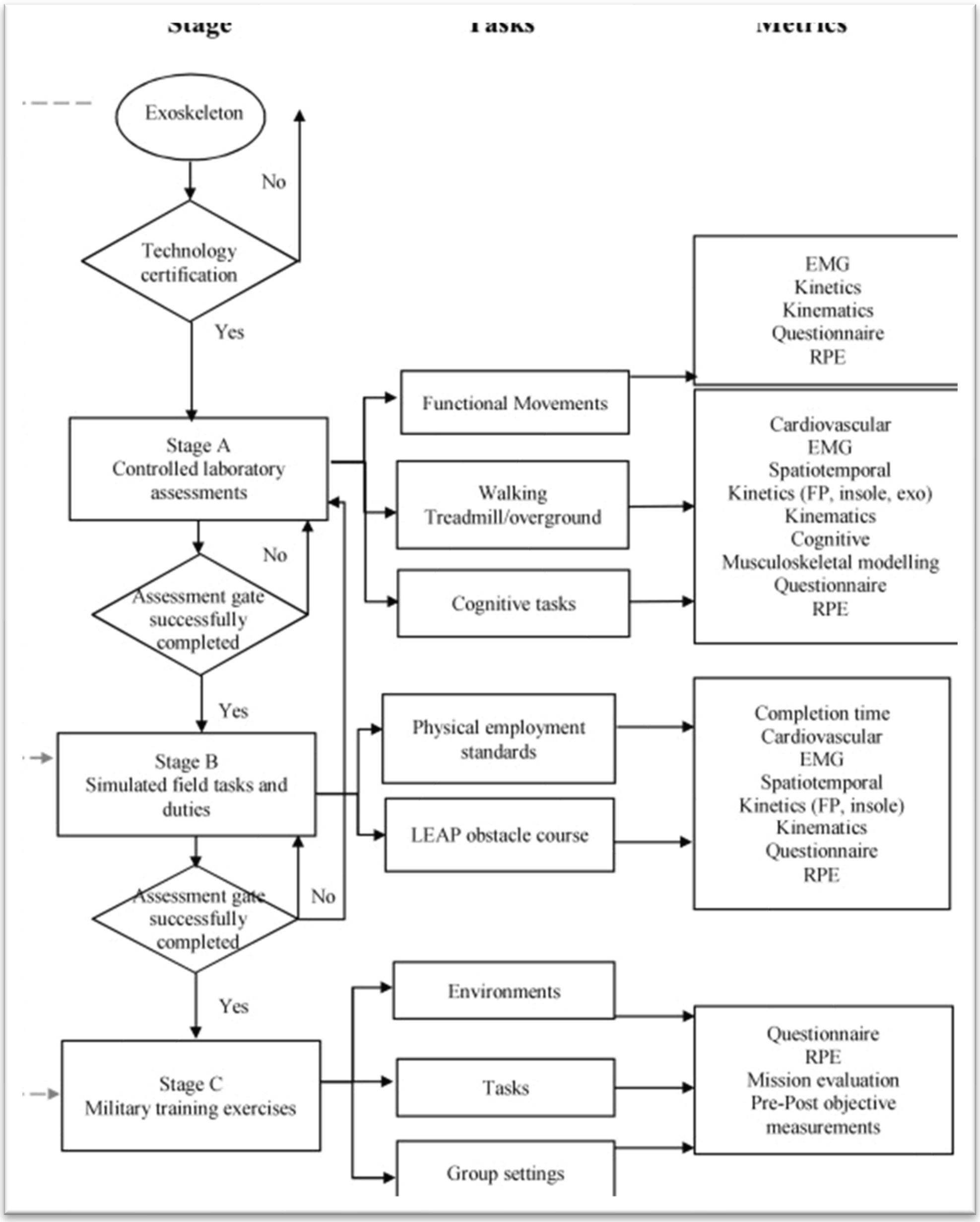


Figure 11. Testing methodology

(Source: (C.Billinge, 2018))

The image above presents the stage-gated process "from simple and controlled laboratory evaluations (Stage A) to more complex simulated and real-world military tasks (Stages B–C). Whilst a device is intended to progress from the top down, relevant components of the testing construct can be selected to best suit the intended application and maturity of the technology as detailed by the outer dotted grey line" (C.Billinge, 2018).

There are unclassified data given by the US Army after intensive testing of the suits, and the results are encouraging. They tested the ability to perform basic military movements, compatibility whit the military gear, if they are handy to use, if they are a generic size, mobility performance, shooting performance, errors that can occur, comfort, heating stress, biomechanics, physiological stress, different weather conditions, different types of soldier roles (Angela Boynton, 2017).

Conclusions

The exoskeleton "costumes" are made to provide safety features, strength and endurance to human soldiers, military health workers, and even workers in different industries when robots can`t be used.

Their key features are:

- To lower the energy required for heavy tasks and alongside with it reduce the fatigue
- Reduce the stress over the muscles
- Get a normal alignment of the bones and joints to relief the stress and keep an optimal position of the body
- Offer better support for heavy weapons over long distances
- Increase the ability to climb stairs and traverse rough terrains
- Protection of the soldier`s body
- Nevertheless, the exoskeletons should never interfere with a soldier`s skills and shooting ability.

From the data held so far, we realize that especially the soldiers will benefit from good physical protection, help in terms of supporting the necessary equipment in the field conditions and the status of superhero/supermen, or rather will be half man, half robot.

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Securing high amounts of data through network architecture

Alexandru Antonio PAUN

Romanian-American University, Romania

Abstract

In the context of digital evolution, the security of client-server applications is a matter of great importance in the Internet and intranet networks. Ensuring network security is done through a multitude of security services such as authentication, authorization, availability, confidentiality, integrity, and non-repudiation. Their implementation is accomplished through different security models, such as arborescent and stratified. Some of the security techniques are physical security, logic, public key cryptography, private key cryptography, digital signature, digital certificate, hash technique, bookmarks, and security policies. Some of the aspects studied are vulnerabilities, types of attacks: local, remote, active, cryptographic and security protocols.

Keywords: security, client, server, network

Introduction

Security services are a category of network services offered as part of the operating system in multiple types of software. These are either part of certain programs or are offered independently. Also, some of these services can also be deployed directly into the hardware circuitry (Blockmon, 2018).

Applying security measures is justified for sensitive data, which must indeed be protected because their implementation is expensive in terms of prices and resources.

The choice of services is conditioned by the nature of the information and its costs. Choosing an effective security strategy involves preventing exposure risks and covering vulnerabilities in order to tailor the security solution to the needs of each network and reduce costs.

The paper contains a brief presentation of security models and their application at the network level. According to Reinhardt Bota, some of the security services are (Information Security in the Client/Server environment, 1997):

- Authentication - a mechanism for identifying a human user, equipment or software program
- Authorization - the framing, delimitation of a user's access to data or programs, after the authentication process ends successfully
- Availability - the service that manages users' access to other services through groups
- Privacy - the protection of private data
- Integrity - refers to keeping the data unchanged
- Irrelevance - the prevention of impersonating another account to perform fraudulent actions

Factors and delimiters

Some of the factors that affect the cost of Security services are physical transmission medium, performance of network equipment, performance of packages (applications / operating system) software used, and Data Security Encryption Level.

According to Scripcariu (Luminita Scripcariu, 2008) , it is important to prioritize and classify data stored or transferred to the network, i.e. the information, for proper security.

According to the ownership criterion, the information is divided into a user information and a network information. By the criterion of importance, the information can be public and private. By location, the information can be internal or external. According to the field of use, there are different types of data (information): advertising, commercial, educational, entertainment, with or without payment, government, military. Each of these types of data and information can have different security models that are applied to them.

I. Security Models

A computer network is a system of interconnected resources, used by a lot of users, with specific rights to use them, and network security should be provided modularly, on the three levels, i.e. information, logical, physical (Oracle, 2013).

In the security-centered security or information model, the layers represent security levels. They offer protection to the subject that will be secured. Each level gives another layer of isolation to the subject and makes it harder to access in unpredictable ways. This model is called "onion model" in the literature because each level offers added security:

- Level II - Integrity of information
- Level SI – Suppressing the information
- Level SLS - Logical Security of Services
- Level SLA - Logical Security of Access
- Level SF - Physical security

The layered security model described above is used with maximum network node efficiency. Communication processes involve at least two nodes, as well as transmission paths between them. As a result, security must be evaluated in each node as well as in each flow or flow path in the network.

Another type of model used for security services is the "tree type". This model should be applied to networks where distributed resources are deployed on multiple servers in the network. Information is transmitted from the source node to the destination node using network nodes and different physical communication paths, whether they are used or not. The "weakest" element on the transfer path (communication channel or node) determines the degree of security of the data transfer process in the network will be given by the "weakest" segment of the transfer path. As a result, all segments used in the transmission path need to be secured to increase network security.

In the arborescent security model, the client is considered the root in the diagram, the servers are terminal nodes, and communication equipment is intermediate nodes. At each node, the first security centered model of the subject can be applied. The links between the nodes are the physical communication paths that can be wired or radio. In the case of networks with redundant mesh topology[1], it is difficult to identify the "tree" of communication, but it can be imposed by strict routing decisions on a certain path in the network.

Defining a network security metric is recommended for routing a specific security packet. Unlike the usual metrics used by routing algorithms, the security metric must include the security level provided by the nodes delineating a graph arc. It is also useful to use oriented graphs and separate representation of up-link and downlink links between two network nodes in asymmetric communications with different transmission media and technologies. The security metric will be based on the security risk that a particular element of the network graph shows. The decision on the optimal transmission security route will aim to reduce the security risk to the level required by the maximum admissible costs. The security degree of a packet can be expressed by optional security bits included in the package header.

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[1] Type of networking where all nodes cooperate to distribute data amongst each other.

The utility of this model is enhanced in the analysis of distributed attacks, launched across multiple nodes, in which it is difficult to identify the attacker.

In the field of communications networks, various security models have been proposed by software companies and software vendors for different application areas that require the protection of privacy or confidential information (for example, the HIPAA "Health Insurance Portability and Accountability Act", the GLBA "Gramm-Leach-Bliley Act", as well as payments through PCI DSS - Payment Card Industry Data Security Standard).

Physical security

Physical security is the external level of the security model and generally consists of the "under-key"[2] protection of computer equipment in an office or other premises, as well as the provision of security and access control.

Because a lot of attacks starts from within the network, communications networks have a high degree of difficulty in managing them effectively, being vulnerable to internal and external attacks. This degree of complexity is generated by multi-organization management for the same network, geographic spread, diversity of equipment types, operating systems, and a high number of entities in the same network.

Employees who administer the network must comply with and ensure the rules of good functioning and physical security delineated by security policy. Thus, equipment and cables used in the network must be mounted on the wall to protect them, in places that are not used frequently, in order to avoid damage either intentionally or accidentally. Servers should be located in closed rooms with restricted access to protect them from unauthorized physical access and the equipment must be protected from electrical disturbances by the use of uninterruptible power supplies (UPS), which ensures the continuous operation of highly important equipment. Physical access must be secured

[2] Locked away safely

through various equipment, such as key devices, cards and access codes, biometric and motion sensors (voice, fingerprints, retina/face, signature, hand, etc.).

Physical security can be ensured by proper network space provisioning, physical access control, restriction and video monitoring, Intrusion Detection System (IDS) from unattended areas with Remote Alarm Indicator (RAI).

Physical security measures of the network are established on the basis of security vulnerability and security risk analysis of the network, based on the security policy adopted and implemented by the management group using different software and hardware.

Logical security

Logical security refers to the protection of logical access to network resources and services. This is achieved through software tools and facilities that ensure the control of access and use rights.

There are two great levels of logical security: (1) Access logic security (SLA) that refers to system/network access, user account, and documents (files) and (2) Service Logic Security (SLS) that includes access to system/network services based on waiting lists, disk entry/exit, control, and management. Service Control (CS) monitors and reports service status, activates or disables the services provided by the system and the network. Service Rights (DS) determine who and how to use a particular service.

Security of information

Cryptography is a branch of mathematics, which deals with the secrecy, authentication, and restriction of access to information in a computer system. Cryptography uses mathematical methods, based, for example, on generating large numbers (Andersson, 2009).

Encryption is the process of converting the original information (plain text - plain text - M) into a text that cannot be read by people (ciphertext - C) using an encryption key (KE) (SecureBlackbox, 2006).

Decryption is the inverse of the encryption, that is, the transition from the unintelligible ciphertext to the original text using a key (KD).

Security Policies

These are the principles underpinning the security of a communications network and are expressed as a set of rules and practices. Thus, the needs of each category of users with regard to network resources and access rights, whether inside or outside, using the wired structure or wireless access to the network, must be established. It also needs to be established which users really need access to the public Internet network. All these aspects are dealt with within the access policy.

A breach in the security of any network is the connection to the Internet and to the public network in general because it acts on attacks from outside the network. Clear principles are needed to secure the interfaces between the public and the private network. The principles according to which Internet access routes are secured and rights granted in this respect constitute the Internet-Acceptable Use Policy (I-AUP).

The username and password authentication method implies applying passwords for accepting, managing, and changing passwords within the password management policy.

Access rights to the network must be differentiated in terms of access to documents and their rights (reading, writing, modification or deletion).

Knowing in detail all the equipment that connects to the network and the guarantees offered by each user is the premise of right decisions on the privileges or restrictions that are imposed in each case (connection policy). The denial of network access for those entities for which the intention to attack is proven through traffic monitoring is a major force measure, which is necessary to keep the network operating safely.

Security vulnerabilities are caused by various factors, including not updating operating systems, antivirus programs, or other security programs or modules. Periodically it is necessary to install the latest versions of software, to update the databases with newly discovered viruses or other recently identified forms of attack. Also, periodically, staff involved in network security should be trained to know any new risks to which the network is exposed and the procedures to be followed to resolve problems. The different network equipment needs to be periodically reviewed to determine whether they meet network security needs at a particular time, including passwords, access control lists, MAC addresses, encryption keys.

Encryption of information is required as the last measure to ensure transmission secrecy when an intruder manages to download packets from the private network. Also, encryption is a measure of security with regard to the secrecy of special information that can be attacked by outside and within the network. The principles of information security are included in the information protection policy.

Virtual Private Networks (VPN) are a good security solution, adopted primarily by companies with multiple locations spread over a wide geographical area. Remote access often presents high-security risks caused by attack attempts by people outside the company, and security is required based on clear principles of remote access rights and restrictions and security tactics which have to be adopted according to the remote access policy. Specific security policies can be set for each network service (e-mail, file transfer, network user information, etc.).

Security rules may be binding or optional, resulting in several categories of security provisions:

- Mandatory provisions resulting from agreements, regulations, and laws, expressed in detail, as many specific elements, depending on the field of use, are intended to provide reliable confidence in a communications network or a particular entity (server, service, program, etc.).
- The recommended, though non-binding, provisions are motivated by the serious consequences of not applying them. For best network security, they must be considered as mandatory, although their deployment costs are generally high. For example, it is not required to run antivirus programs or install any security patches from operating systems. all this involves some additional costs (price, system memory, processing time), but in a network, each unsecured node can be a gateway for attackers.

- Informative provisions have the role of alerting users to the existence of vulnerabilities (for example, not updating virus lists for antivirus programs), the risks and consequences of security breaches of systems and networks.

II. Vulnerabilities and attacks

Because a communications network is a complex, heterogeneous system with many users, it is a convenient area for various attacks. Therefore, security is a vital operational objective of any communications network.

The computer networks of the various organizations are used both to communicate between employees and to external communications so that they can no longer be isolated and must be secured at the level of the public and private network access interfaces.

Vulnerability of networks

Depending on the vulnerabilities of the communications network they can exploit, attacks can be manifested in many ways, for example unauthorized access to the network or its resources inside or outside the organization; attempts to disrupt or interrupt the physical functioning of the network; modifying or destroying information, that is, attacking the physical integrity of data Other examples of attacks are the attempts to interrupt or overload network traffic by transmitting a large number of packets to one or more flood nodes, soft attacks on network equipment that concentrate and direct flows into critical nodes (switch, router , access point etc.) by modifying configuration files and access rights set by authorized personnel. Take over and unauthorized use of information, that is, breach of confidentiality and copyright is also a form of attack.

Types of attacks

Taking into account where they run, attacks can be local (local), remote (remote). Another classification of attacks on communications networks, depending on how they act as a source and destination, attacks can be centered on a single entity (for example, a particular server is attacked on a single device), or can be distributed (launched from multiple locations or multiple cars simultaneously).

Distributed attacks make it difficult to identify and locate the authors, and their effects are maximized by attacking the network in multiple nodes simultaneously.

According to the attacker's interaction with information obtained from a successful attack, the attacks are active or passive and it is hard to say which one has a higher risk. At first glance, the most dangerous are the active attacks. However, in the passive attack encryption keys are taken without the key server to figure out which keys are compromised, thus all the information encrypted with those keys becomes completely unprotected.

Although there are no solutions that are able to protect the network from any kind of attack, there are some security systems that can greatly reduce the chances and effects of attacks. It is necessary to develop a security policy appropriate to each network, to apply it simultaneously with user education and to adopt security, software or hardware solutions that are suited to the vulnerabilities and attack risks specific to each network.

III. Protocols and security servers

TCP/IP Protocols

Internet services are based on the exchange of messages between a source and a recipient. The principle of communication is inspired by the postal system. The data unit thus obtained is called 'packet', by analogy with the regular postal system.

The Internet Protocol (IP) provides packet delivery only if there are no errors in network operation. If a message is too long, the IP requires its fragmentation into multiple packages. The transmission of IP packets is done between host computers and not directly between application programs. For these reasons, the IP protocol is complemented by another one, the TCP (Transmission Control Protocol), which makes fragmentation and ensure the correct transmission of messages between users. The packets of a message are numbered, making it possible to check their receipt in the form in which the long, multi-packet messages have been transmitted and reconstructed.

Protocols are grouped by levels, following the principle of stratification. The protocols are designed so that the N level of the destination receives (without modification) the object transmitted by the level N of the source. In order to comply with this principle, the definition of any protocol has to establish two aspects, the format of the data units being manipulated, and the possible actions of the protocol entities that compete to achieve the protocol-specific services.

IPv4 Protocols

Data is sent as a block of characters, called datagrams or packages. Each packet is composed by a small set of bytes, called 'the header' followed by the actual data that forms the contents of the package. Upon arrival at the destination, the data transmitted in the form of distinct packets are reassembled into logical units of file type, message, etc. The internet switches the packets on different routes from source to destination, so it is called a "packet switching network".

There are three distinct ways to connect two gliders using the IP protocol. The two computers can be in the same local area network (Ethernet or Token Ring[3]). In this case, the packets are encapsulated in the packets used by the LAN protocols[4]; The two computers are directly linked by a serial line. IP packets are transmitted using one of the SLIP (Serial Line Internet Protocol) protocols, such as CSLIP (Compressed SLIP) or PPP (Point-to Point Protocol). If the two computers are each connected to a local network, the

[3] Local area network in which a node can only transmit when in possession of a sequence of bits (the token), which is passed to each node in turn.

[4] Standards that define how data is ultimately transferred from one system to another

telephone line links the two LANs via bridges; IP packages can be encapsulated within other packages used by other network protocols.

TCP/IP Security

Connecting a computer to the Internet generally involves using the UNIX[5] operating system and the TCP/IP protocols suite. These components have their own security issues highlighted in previous sections of the book. Internet access also involves the use of a set of dozens of services, programs, with many security issues, either due to software mistakes or due to the failure to incorporate the right security features. In general, for a user to be able to take the appropriate security measures when connecting to the network, he/she must understand how the UNIX operating system works with the Internet. That is the security issues associated to TCP and IP.

Firewall

For computer science, perhaps the easiest way is to first describe what a firewall is not: a firewall is not just a router or a host computer that provides network security (Loza, n.d.). Broadly speaking, a firewall (sometimes called a security bridge) is a system that requires a policy of access control between two networks. A firewall is the implementation of this policy in terms of network configuration, one or more host and router systems with special functions, other security measures, such as cryptographic authentication of clients.

As Justin says (Wllingwood, 2015), because a firewall is disposed at the intersection between two networks, it can be used for purposes other than access control. For example, it can be used to monitor communications between an internal network and an external network. A firewall can monitor the services used and the amount of data transferred through TCP/IP connections between its own organization and the outside world in another example, a firewall can be used to intercept and record all

[5] Proprietary operating system

communications between the internal and external networks. A leased line that allows speeds of up to 128 Kbps, assuming 100 percent of the time would transfer about 1.4GB per day, which would allow for a few days to run on a single digital magnetic tape 8mm.

If an organization has several geographically separate networks, each with a firewall, it is possible to program these firewalls to automatically encrypt the contents of the packets transmitted between them. In this way, on the Internet, the organization can create its own private virtual network.

Intrusion Detection Systems

Intrusion Detection Systems (IDS) are a complement to firewall activity in the security of a communications network and consist of passive solutions for analyzing, classifying, and reporting unwanted network events.

IDS systems detect network attacks, alert management staff and eventually trigger response actions, such as quarantining certain processes until the situation is clarified. There may also be false alarms, but the procedures applied in the first phase will only delay some transmissions (Rozenblum, 2001).

VPN - Private virtual networks

A VPN is a private communications network commonly used by one or more organizations to communicate in a confidential way through a public network (Mason, 2019). VPN traffic messages can be transmitted through the infrastructure of a public data network, such as the Internet, using standard protocols, or through a private network of the Internet service provider.

VPN is a cost-effective solution so that different organizations can provide access to the internal network for remote employees and collaborators. The term VPN describes two ways to address the problem of private networks that support a public network from the point of view of accessibility. VPNs built between several LANs (LAN-to-LAN VPNs, also known as Site-to-Site VPNs) that connect to a central node several different LANs at a distance some others but that are part of the same intranet, so as to ensure connectivity between them. Remote Access VPNs that provide remote access to a private network, for example, for mobile Internet users. At the transport level, several security protocols have been imposed, such as Secure Socket Layer (SSL), which ensures authentication and integrity of TCP-based applications but has a major drawback to lack of flexibility and application-level dependence; TLS (Transport Layer Security), that has developed as an alternative to SSL that solves most of its inconveniences.

Conclusions

There are many issues of access control and network security that need to be considered in implementing and maintaining a client-server system. Although there are a large number of tools for security features, they are significantly less for this type of system.

To avoid possible security breaches, the security of storage and data transfer channels, the security of data encryption and accessibility to the public should be analyzed.

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Authentic Learning

Vlad-Gabriel ROȘU

Romanian-American University, Romania

Abstract

Learning is a social process. We learn by interacting with the environment, communicating, negotiating meanings with other people, directly or mediated. It seems justified, desirable, for the parent to ask the child who has arrived home from school: "What did you learn today?". Equally justified would be the question addressed to the adult who came home from work, from a meeting or from shopping: "What did you learn today?". In other words, what did you notice (new), what new connections were made in your mind (of which you became aware) as a result of exposure to the environment in which you were? What will you do better, easier, more profitable, more efficient on an upcoming occasion as a result of what is "learned" today?

Introduction

Learning is not measured in the scores we get on control papers, national exams or aptitude tests. Authentic learning could be measured in the degree of confidence we have in the clarity of a mental representation we have created about an idea, a process, a phenomenon. Connecting individuals in the learning process means that we help each other to perceive ideas, processes, phenomena with the same degree of acuity.

What is authentic learning?

Authentic learning has a lot of definitions, but the most important refers to what students learn significantly by engaging them in relevant and real-world learning. A scientific definition is given by Donovan, Bransford, & Pellegrino, in 1999, who argued that: " *In education, authentic learning is an instructive approach that allows students to explore, discuss, and meaningfully build concepts and relationships in contexts involving real-world problems and projects that are relevant to the student.* "[6]

This authentic learning refers to a "wide range of educational and instructional techniques focused on connecting students in school to real-world problems and applications. The basic idea is that students are more interested in what they learn, more motivated to learn new concepts and skills and better prepared to succeed in school, in their careers and in adult life, when what they learn reflects the contexts, situations in real life, correlates them with practical and useful skills and addresses relevant and applicable topics lived outside of school "[7].

Authentic training takes a different form from traditional teaching methods. In a traditional classroom, students have a passive role in the learning process. Knowledge is considered a set of facts and procedures that are passed from teacher to student. In this way, the

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[6] https://web.archive.org/web/20190326200652/https://www.rubicon.com/what-is-authentic-learning-and-how-do-i-use-it/ accessed on 04.20.2020

[7] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

purpose of education is to have a wide collection of these facts and procedures.

Authentic learning, on the other hand, has a constructivist approach, in which learning is an active process. Teachers offer students the opportunity to build their own knowledge by engaging in self-directed research, problem solving, critical thinking and reflection in real world contexts. This construction of knowledge is strongly influenced by the student's previous knowledge and experiences, as well as by the characteristics that shape the learning environment, such as values, expectations, rewards and sanctions. Education is more student-centered. Students no longer simply memorize facts in abstract and artificial situations, but experiment and apply information in ways that are encountered in reality. [8]

Authentic learning can also intersect with a variety of ongoing debates about how and what should be taught in school. There are some critics who question whether authentic learning experiences can provide sufficient academic content in the main fields to ensure that students acquire a well-defined knowledge base. They also say that genuine learning and instructional strategies can replace many traditional and effective forms of teaching but fail to convey "basics" to students or lead to cluttered classrooms. However, it has been proven that these criticisms are unfounded and that a well-planned curriculum, built around authentic learning experiences, can cover all the academic topics and concepts that students need. In some cases, criticism arises in response to a negative experience with authentic learning or a misunderstanding of the concept.

Authentic learning can also raise many issues - both among teachers and instructors. For example, genuine learning may require much more planning and training, and teachers may need to acquire new or more sophisticated instructional techniques or substantially revise the lesson plans they have used for years. Authentic learning can introduce even more logistical complexities, especially when learning experiences take place outside the school or classroom (in schools, even minor logistical tasks, such as organizing trips or securing parental leave, can take a long time.).

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[8] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

Authentic learning is real life learning. It is a learning style that encourages students to create a tangible and useful product to share with their world. Once a teacher provides a motivational challenge, he or she provides and takes care of the criteria, planning, resources, and support needed to tailor the content for student success. The teacher becomes a guide or event manager, a facilitator, not a dictator. Learning as a process predominates, and the content collected is properly organized in portfolios.

Authentic learning involves all the senses which allows students to create a meaningful, useful and common result. These are real life tasks or simulated tasks that give the learner opportunities to connect directly with the real world. Instead of victoriously discussing topics and storing information in a traditional way of the industrial age, authentic learning provides support to the student in order to turn it into a tangible and useful product, which can be managed in society and the real world. [9]

What are the characteristics of authentic learning?

There are **10 elements** that researchers claim to be the **essence** of authentic learning. According to them, every learning experience must have[10] :

a. **relevance in real life** - the activities carried out and the tasks received must have practical applicability, the learning being centered on authentic and pertinent tasks in real life, which arouse the interest of the students.

b. **problems requiring solution finding them** - tasks difficult to solve, having no obvious answers or solutions, is extremely complex themes closely linked with the world beyond the classroom. Learning begins with a problem or a question, which allows the student to give his own answer → the result of the learning experience cannot be predetermined.

[9] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

[10] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

c. **sustained investigation** - projects and tasks that require time to find solutions, students being active in exploration and investigation. Students use various techniques, from various disciplines, with complex structure[11]

d. **multiple sources and perspectives** - resources can be both theoretical and practical but must challenge learners to distinguish relevant information from unimportant ones.

e. **collaborating** - carrying out projects and solving tasks requires social connection as individuals cannot achieve success alone.

f. **reflection** - learners need to reflect on their own learning, make choices and set goals appropriately. Thus, higher-level thinking capabilities are targeted, such as analysis, synthesis capacity, design, manipulation and evaluation of information.

g. **interdisciplinary perspective** - projects are not limited to a single object or a single category of knowledge but will involve the integration of content from various disciplines and will lead to results that exceed the limits of a discipline.

h. **integrated evaluation** - the evaluation of learning is done in an integrated way, from the perspective of the real utility of the product, not through test or other types of classical evaluation.

i. **final product** - activities and projects will lead to the realization of a product that can be shared outside the school, having its own value. Concrete final products are sought, which can be evaluated and criticized → this feedback allows reflection on one's own learning.

j. **multiple interpretations and results** - there must be more possible solutions and answers.

In essence, **genuine learning** is **multidisciplinary, based on skills used in a real context,** demonstrating to students that their **learning is connected, relevant and can have an impact on the world as well as their future.** This is seen as an opportunity that **promotes social discourse, collaboration and reflection.**

[11] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

It is important to know that authentic learning:

- ❑ it is extremely well organized by the one who leads it.
- ❑ is not at hand in the contextual situations in which teachers or students are placed, the situations in question may be starting points in exploration, interconnection, research, learning, etc.
- ❑ involves design adapted to children's needs and flexibility during the learning activity, depending on what is happening from a cognitive and emotional point of view.
- ❑ aims at sensory activities, meaningful tasks and the exploration of a variety of abilities and skills in real life;
- ❑ involves practicing it regularly;
- ❑ optimal learning involves: using all the senses to the fullest in learning experiences, interaction, manipulation, exploration, collaboration, dialogue, open discussions, time to put reason and creativity to work.

What is the purpose of authentic learning and what are its benefits?

Why is authentic learning beneficial? Every day we are put in situations of behavioral adaptation, problem solving, decision making, issues that we manage to achieve through the use of knowledge, previous experiences and abilities, skills and abilities we have, as well as of the choices we make.

This is the **purpose** of authentic learning: **to teach students to train and use these skills, abilities and skills, to demonstrate the connection between learning and real life and to give students the skills to solve the problems they have for the afterlife. by school.** [12]

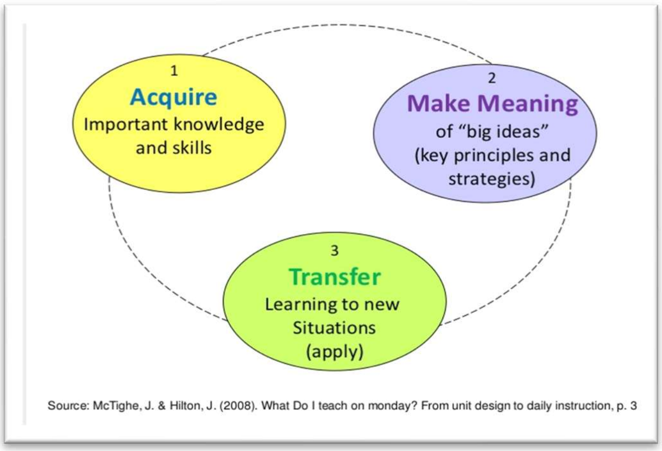
[12] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

Along with these, **authentic learning experiences** offer students the opportunity to address the three learning **objectives** (LMA):

➔ Acquisition of new knowledge, skills, abilities and skills (Acquisition)

➔ understanding "big ideas" - key principles and strategies (Make Meaning)

➔ transfer - application in new situations (Transfer)



By designing learning experiences that take into account relevance and promote authenticity, teachers can plan learning activities that address all three objectives, so that they will allow teachers to become "coaches of understanding, not simply providers of content or activity. "(Wiggins and McTighe, 2011) [13].

Authentic learning experiences also generate commitment from students, not just teachers. It is important for students to ask the teacher, "Why are we learning this?" or "When will I use this in real life?".

Authenticity gives relevance to the learning experience; relevance encourages involvement and enthusiasm, which should lead to meaningful learning.

Thus, we can say that authentic learning has a multitude of benefits, of which, we list a few, which we consider significant:

- increases motivation and interest.
- learning has positive effects on the training period, but especially on caries and adult life.

[13] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

- assimilate types of modus operandi and modus facendi, not knowledge.
- offers different perspectives on a reality.
- emphasizes the ability of superior thinking.
- cultivate patience.
- cultivates flexibility.
- favors critical thinking.
- facilitates the teaching of skills.

What is the recipe for authentic learning?

Is there a recipe for authentic learning activities? The answer is no, but specialists make some recommendations in this regard.

Thus, as a teacher, a first condition is to know your students very well, their age characteristics, their concerns, passions, issues that arouse their interest and curiosity, learning needs, their strengths and weaknesses, abilities, the skills and abilities they have and their level of development. Based on these characteristics, the teacher can determine a possible topic that will be the subject of a project, through which he will seek to obtain an authentic and relevant result, which will be related to real life. The teacher should stimulate and exploit the knowledge, skills, abilities, and skills that students have so that they can use them in carrying out the project, even if they are more suitable for other areas than the one for which they are going to develop. the project. To carry out this step, the teacher must talk to the students and ask them what knowledge, skills, abilities, and skills they think are necessary for the project. Each student must have a role in designing the learning activity, which helps to eliminate a possible hierarchy, which will increase their self-esteem and give them confidence and control over the progress they make. It is also necessary for students to have enough time to achieve all three objectives: acquiring knowledge, skills, abilities and skills, understanding the "big ideas" and transfer (application in new situations), according to the AMT model. The teacher's role is to facilitate, guide, train, teach and evaluate students throughout the project, helping them to determine the next steps, using the knowledge, skills, abilities and skills they have and developing new ones. A final self-assessment is useful for every student who should ask themselves: What did I know? What have I learned? What knowledge, skills, abilities and skills have we gained? C is I want to know what I learned?

Here are some concrete examples[14] Authentic learning:

- learning through simulation
- media created by students
- learning through inquiry[15]
- peer review
- work through dedicated software[16]
- research data analysis
- learning through projects[17]

What are the ways of authentic learning?

Researchers in the field of educational psychology, neurobiology and cognitive science have discovered that the human brain is always longing for new things - it is always looking for only unusual, strange, unexpected things that stand out. Thus, the brain deals only with interesting things and stores only the information that matters, eliminating and ignoring the ordinary, normal, routine or boring things it encounters.

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[14] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

[15] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

[16] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

[17] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

However, one can try different things to intensify the activity of the brain, to activate the neurons in both cerebral hemispheres - things that provoke, motivate, train, inspire to solve problems and discover new knowledge.

The brain is stimulated by emotions, so the essential element that increases attention (concentration), understanding and memory, is the emotional load of the studied material. Information is retained much faster when the material makes you " feel" something. The stronger the feelings during learning, the faster it will be stored information for a long time.

Experts in the field of rapid learning have found that the most effective way to absorb and acquire new knowledge is this: as you learn, think about how you could "teach" the new material to someone else. Imagining that we have to explain in our own words the new knowledge to another person, who knows nothing about the subject, the information is strengthened and deepened.

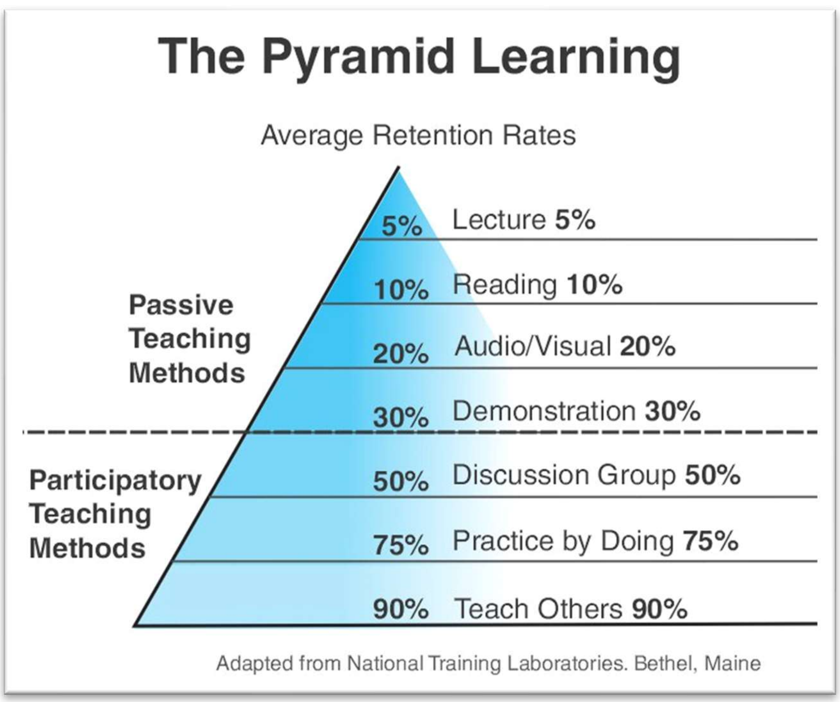
It is important that when we explain new knowledge to others - and even ourselves - we do not use exactly the words and wording in the original text (the one to be learned), but rephrase the content with our own words. Formal tone and academic language must be partially eliminated, any concept, regardless of complexity, can be rendered in simple terms, as if a child should understand it. By doing so, you gain four things:

1. Concentration becomes easier, faster and better - because ordinary language, used in a conversational style, captures attention, just as a discussion keeps us trained for longer than a lecture. When people get the impression that they are in a conversation, they suddenly become attentive, because they have to follow their interlocutor and intervene in the discussion, when necessary (eg in the case of a question).

2. Improving the understanding of new information - the effort to reformulate the content in your own words and to explain it in a way that everyone can understand, "sets in motion" the neurons, causing high brain activity.

3. Faster learning: As the material is very well understood, it does not take much extra effort to memorize it. Thus, the contents are learned naturally, the new knowledge integrating itself in the structure of the already known information.

4. Prolonged storage of new material; because the concentration necessary to explain the content, in one's own words, to another person, causes them to penetrate deep into the subconscious, where they become a permanent part of long-term memory.



The learning pyramid

What are the standards for assessing authentic learning?

According to studies conducted by researchers in education, the standards of assessment of authentic learning[18] are:

- higher thinking - considers the extent to which students use higher order thinking
- depth of knowledge - refers to the substantial nature of the ideas in a lesson and the level of understanding that students demonstrate as they analyze these ideas
- connection with reality - the class has value and significance beyond the instructive context
- conversation of substance - speaking to learn and understand the substance of a subject
- social support for learning students - involves high expectations, respect and inclusion of all students in the learning process

Conclusions

According to Steve Revington, a pioneer in authentic learning and recipient of the Prime Minister's award for Excellence in Education in Canada, "Authentic learning is the essential setting that education requires to move towards sustainable, meaningful, relevant learning in the 21st century. It is not the latest strategic vessel to explore education's ocean - authentic learning is the ocean." He believes that our greatest shortcoming in education these past few years has been to ignore the brain research that is richly available to us that affirms that implementing multi-sensory activities, pursuing meaningful tasks, and exploring a variety of skills with real world applications is optimal learning - and that it needs to be practiced regularly.[14]

Therefore, learning being a social process that can involve interaction with the environment, meaningful communication, negotiation with other people, in my opinion

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[18] https://www.tandfonline.com/doi/abs/10.1080/00461520.1991.9653139 accessed on 04.20.2020

would be more efficient that this social process, learning, be authentic, real and meaningful.

Thus, through authentic learning, the confidence coefficient that we gain in shaping an image would increase and then, opinions, concepts that we formed, learned about an idea, process, phenomenon, notion, etc.

The real, deep connection of those involved in the learning process determines the perception of ideas, processes, information that seem abstract and meaningless. With more of a personal touch, feeling those will generate the acquisition of knowledge, notions, information with a high degree of acuity, and this can be achieved through authentic learning.

Through authentic learning, I believe that one can obtain a form to determine a superior thinking that generates an understanding, perception, meaningful insinuation of the concepts offered for learning. This will be revealed in the way of analyzing the concepts, and the analysis will acquire a real value determined by numerous connections that can give birth to new ideas, principles, beliefs, with substance, with applicability in real life, regardless of the chosen field or context.

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The effects of technology improvements on video production

Doru-Petrisor TURICA

Romanian-American University, Romania

Abstract

Video production is a process which englobes a multitude of areas ranging from the actual planning, setting and staging of scenes and actors to the various methods of layering, stitching, editing and rendering of the aforementioned video material. This paper aims to show how the quality and affordability of such methods have influenced people to create close to studio level results and performances.

Key Words: Technology, end product, quality, time.

Introduction

As a major part of economy for a long period of time, the movie industry has been constantly evolving as to both improve their means of producing content and improve the quality of their final product. Also, time has brought some changes in the form of more explicit laws, most of which concerning human and animal safety. Although this has made the job of studios easier at times it has also backfired due to the increasing demand and expectations of the masses. For many years now, the majority of the production costs seems to have surprisingly balanced between technology improvements and crew. Therefore, while movies in the past spent the majority of their money on improving their means of production, nowadays it is almost evenly distributed between staff members, actors, writers and means of post-production. Although the laws and regulations in place forbid common people from creating and making profit off of movies outside a professional setup, technology availability has made it easier for the public to take a shot at creating their own “movies”, gather knowledge and even start a career in the movie making industry. Apart from that, recent public demand has made social platforms such as Facebook, YouTube, and Twitch be the highest consumed content as of today, competing against the movie industry and by far surpassing television. This has also come as a challenge for the video production industry since they had to adapt to newer generations and their taste in content.

Technological improvements for production studios

The first technological improvement for video production was creating a video itself! (Wallace, D. 2020, January 13) The transition from the still image to a proper video took many iterations to be made and it wasn’t until recent years that it has evolved to even surpass our perception with most videos recorded at refresh rates faster that even our eyes can perceive. One problem of video production at this stage was the unforgettable lack of color. Black and white movies were a staple for almost a decade and bringing color one of the features that took the longest to implement. (Time & Bbva. 2018, June 29). Although movies were starting to get better at interpreting continuous images as being part of one fluid motion, there was still a piece that kept breaking the illusion, sound. After the implementation of sound into movie production, more people started considering this area as a permanent occupation with even actors and crowds starting to transition vigorously from theaters to the movie scene. Moving forward, the movie industry seemed to have settled on creating practical effects like explosions, robots and makeup for the longest of time until the recent development of computer-generated imagery or CGI (Computer-generated imagery. 2020, April 18). As of the creation and improvement of the digital editing and post-processing, many creators could set free their imagination and create movies that are out of this world. Furthermore, this has shifted the expenses of the video industry from people on the field, to people editing and rendering behind the scenes. This has come as a relief for production studios who came into conflict with several activists and even governments with regards to human safety and animal cruelty (Billson, A. 2018, May 24). Nowadays a majority of the budget is allocated to the safety measures and security of said actors and stunt actors, while animal cruelty has been completely avoided. Another feature that has been successfully implemented and welcomed by the population is 3D technology. (3D film. 2020, April 17) This technology requires glasses with special lenses and a special type of post-processing to generate the effect of depth. This was amongst the latest steps needed for full immersion of the public into the movie scene. Recent innovations went so far as to make a physical camera which films in 3D space using various algorithms and a predefined environment which can be seen by the production in real life. Even though these technologies have made the possibilities limitless the resource demand has skyrocketed. Luckily, as production companies created more demanding algorithms and scenes, their support was swift. Companies like Intel, Nvidia and Adobe have created and updated both hardware and software methods for said companies to make good use of. The last resource which can't be altered no matter how hard support companies try is time. Even with our latest technology it still takes months for scenes to be rendered into multiple drafts and shipped at their launch.

Movie production for every user

As we have previously seen, movie production has come a long way from the beginning and has invested a lot of money into technological improvements which many common users would only wish they could try. Luckily, the aforementioned support companies like Adobe have spotted the opportunity and have given free alternatives of the same software dedicated to major movie companies to the open public. Therefore, similar movie production level software support is made possible for every user to get, experiment and even get a main job through. (Importance of Video Editing) Even though these solutions might seems difficult to comprehend at first they are very intuitive and the companies even provide guides but for moderate prices. Despite of the fact that movie studio level hardware is still too expensive for the typical user it would seem like a letdown. But, as software companies spotted the opportunity for profit through the interest of everyday users in creating video content even of the highest level of complexity and quality, they have implemented several features into their consumer targeted hardware solutions like multithreaded CPUs (Multithreading. 2020, January 2) and tensor cores on recent GPUs (Volta. 2020, April 7) (McCarthy, N., & Richter, F. 2018, August 22). The only major downside to common users is their lack of camera equipment which has yet to be at a reasonable level. However, most of the video equipment companies have created decent cameras to satisfy basic needs of aspiring visual artists, video producers etc. A recently popularised trend in asipiring visual artists is the dynamic scenes made possible by drones. Having been decently priced and easy to control, creativity seems to have become the only limit in the realm of common users. The recent growth of social platforms (Ortiz-Ospina, E.) has made this profession highly appealing and manageable due to ease of use, a multitude of platforms to choose from and reach out to your fans through and even monetisation opportunities (Miah, A., & Jones, J. 1970, January 1), encouraging online video making as a sustainable and self-dependable profession.

Conclusion

In conclusion, time, money and a lot of effort have helped movie studios reach their current point. Having faced the many challenges throughout the history to provide the best form of entertainment for the population and to give life to their imagination, supported by allied companies with a multitude of hardware and software choices up to date to match the standards.

However, the same companies that supported the movie production studios have also paid attention to the interests and needs of the public and have provided similar performance for them at a more accessible price, making the level of quality of the end product very similar.

Despite of the fact that movie studios have invested a lot into these improvements, they are now accessible to almost everybody in the world who has the opportunity and drive to invest their time into this field. The technological improvements have brought the people and the studios closer than everybody ever expected.

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