GSIC
Global Sports Innovation Center
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WINTER AND MOUNTAIN SPORTS: INNOVATION

ANDORRA RESEARCH + INNOVATION

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WELCOME

"Andorra Research + Innovation and Andorra Business created, back on October 2020, the Andorra Sports Innovation Hub, focused on Winter and Mountain Sports & Cycling, with the aim to reinforce the positioning of Andorra as one of the leading global destinations when it comes to the combination of Sports and Innovation. Global Sports Innovation Center powered by Microsoft, with the collaboration of SPSG Consulting, have been assisting Andorra Business and Andorra Research + Innovation since the very beginning of the Andorra Sports Innovation Hub.

Andorra is investing in creating the best conditions for creating an international hub for research, innovation, start-ups and businesses development in the sports industry with a special focus on Winter Mountain Sports and Cycling. Andorra is an historical spot of development for this kind of activities. Therefore, as a Country, we are aware of the current relevance and the future significance of the sports industry, and specially the substantial relevance of innovation that will allow to have a sustainable and consistent development of the country and, in this particular case, of the Winter and Mountain Sports sector, but also to become an international landmark and reference for Innovation and Sustainability in this topic.

Now, in spring 2022, the Andorra Sports Innovation Hub produces the first report of its kind, focused on the Winter and Mountain Sports industry, aligned with their purpose of propelling key sectors of Andorra's economy (7.7% of the national GDP is produced in the sports industry), ensuring public and private sector reasearch, innovation, cooperation and becoming a real "living lab" at country-scale for business development, in this case focused on Winter and Mountain Sports.

Andorra is working and investing in the creation and fostering of the Sports Innovation Ecosystem in order to have a brighter future for the country and help the international community to lead the future changes of this industry. Andorra and Winter and Mountain Sports: the perfect combination fueled by innovation and sustainability."

Marc Pons
Director at Andorra Research + Innovation

ANDORRA RECERCA + INNOVACIÓ

INTRODUCTION

Climate change, a pandemic and changing consumer habits have placed the Winter and Mountain Sports (WMS) industry at the forefront of innovation. For Andorra, 92% of their ski resort visits were international in 2019 [1], so all these uncontrollable variables accelerated their need for digital innovation. As one of the countries with the biggest resorts in the world, one of the highest ratios of ski visitors per inhabitant, and high capacity for adaptability, Andorra has positioned itself as an innovation hub for WMS.

The WMS industry is growing. The winter sporting goods market size is expected to grow at a CAGR of 5.7% up until 2028 [2]. The Winter Olympic Games, the FIS World Cup and the X Games are all attractive competitions with the potential to draw large masses of young audiences. Andorra could currently host 9 out of 15 winter sports. However, economically sustainable elite competitions are becoming sparse. Appealing to a casual audience and offering a wide array of all-season activities, seamlessly incorporated in a digitalization strategy will be the key to WMS success in the long term. Sustainability of the industry will be achieved when strategies regarding People (talent acquisition and retention, especially in hospitality), the Planet, and Profit (via fan engagement, business productivity innovations...) are developed concretely, and cohesively.

Andorra lists 44 different winter and summer experiences, all at the WMS resorts. They have successfully generated a sufficient amount of experiences to cater to all their relevant segments. Through the use of big data and online customer navigation information, Andorra and its stakeholders can refine the offer of activities and swiftly optimize their positioning or proposal if necessary.

Digitalizing businesses does not just contribute to faster and better innovation, but it also provides stakeholders and businesses with valuable information through which they can elaborate reliable forecasts and predictions and better anticipate problems or opportunities in the future. The present report is an attempt at that, collecting valuable opinions from industry experts in order to contribute to the conversation for the future of WMS.

METHODOLOGY

This report benefits from knowledge, information and data from three different avenues:

The Survey

Online questionnaire to GSIC Members and experts in the Winter and Mountain Sports sector

In-depth interviews with industry experts

Collection of secondary information

Special thanks to the industry experts who took part in the in-depth interviews:

David Hidalgo
General Director of Grandvalira

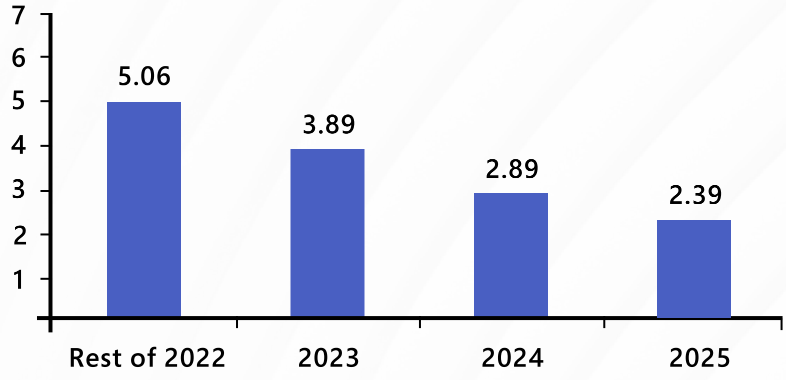
Alfonso Torreño
General Director of Pic Negre

Josep Marticella
Vice-president of Ski Andorra

Xabier Ajona
Director of Naturland

Lluis Orona
Director of Sports Services, Government of Andorra

1.COVID-19 – LASTING IMPACT?



Respondents of the on-line survey were asked to grade on a scale from 1-7 the impact the collateral effects of COVID-19 will have on the WMS industry in the years to come. Unsurprisingly so, the scores given by experts on a survey conducted by GSIC in 2021 are very close to the scores in the present study: the score for the impact of Covid on the sports industry in general for 2022 was 4.96, in the present study a score only 0.10 points over the aforementioned was given for the WMS industry (5.06) [3].

Respondents from the present study appear slightly more pessimistic, something justifiable by the touristic aspect of WMS. These sports have a strong seasonal component and are not just practiced on their own, but utilized as an excuse to travel. The ever-changing travel restrictions have had a notable impact on the industry, which again, can partly justify the respondents' slightly less optimistic outlook.

The innovative and digital aspect of WMS, however, has experienced exponential growth the past 2 years as a consequence of the pandemic, with no signs of slowing down. 9% of accelerated tech startups from a PwC affiliate belong to the WMS industry [4], most of them focused on equipment and training. GSIC Andorra's 2020 Sports Startup Challenge finalists further highlighted this trend, with 2 out of the 10 finalists being specific to the industry and focused on equipment: MoonBikes, now present in selected ski resorts, builds bikes one can use on the snow. Snow 51 is a Chinese company that builds urban winter sport centers. Out of the 53 experts interviewed in a study by Mastercard [5], 30 believed the digitalization brought on by COVID-19 would be positive for the industry in the medium to long term. This accelerated digitalization and innovation could be solely attributed to the pandemic and the inherent nature of WMS.

However, there is an additional and bigger concern for the industry: 2021 was the 5th hottest year recorded on Earth, and the last seven years have been the hottest, displaying a clear trend of global warming [6]. The past Winter Olympics in Beijing highlighted the urgency of the issue: most of the snow in the Beijing 2022 Winter Olympics was artificial and required extensive resources to last the Games [7].

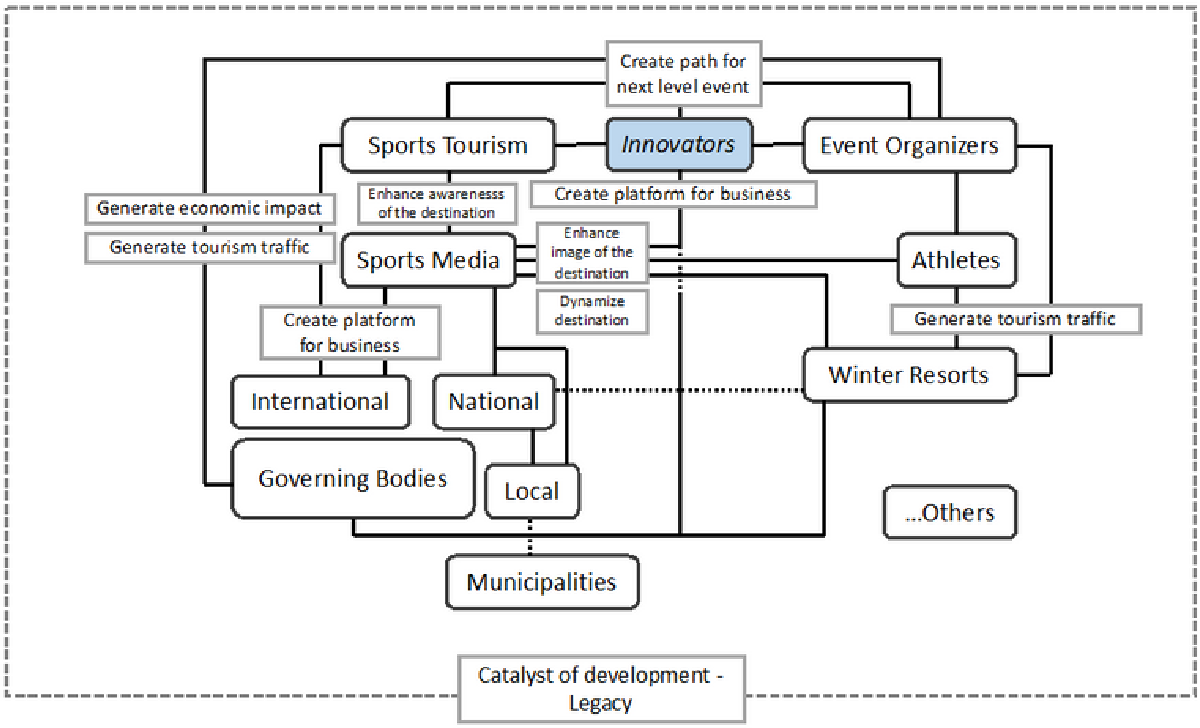
At the current rate of emissions only Sapporo (Japan) would be able to host the games by 2100. There has been a snowmaking system in place for WMS resorts that provides them with more sustainable snow, called "snow-farming", where the snow generated becomes a part of the natural water cycle.

Experts predict government subsidies, permits and incentives for WMS business will become more reliant on sustainability strategies. On an international level, the International Olympic Committee (IOC) has already taken a step, obliging Olympics host countries from the year 2030 onwards to be carbon positive [8]. This has an evident impact on national sports governing bodies, but requires intensive and complex stakeholder coordination, starting locally. Despite the optimistic outlook of many experts, some argue the touristic nature of winter sports contradicts the environmentally friendly positioning the IOC has taken regarding WMS. However, it is relevant to know international efforts additional to the IOC's have arisen to transform sports into an example of sustainability. WMS will not be an exception, especially with the increased scrutiny organizations and institutions are facing from young folk [9]. Examples of international institutions and organizations with sports sustainability as a core aim include:

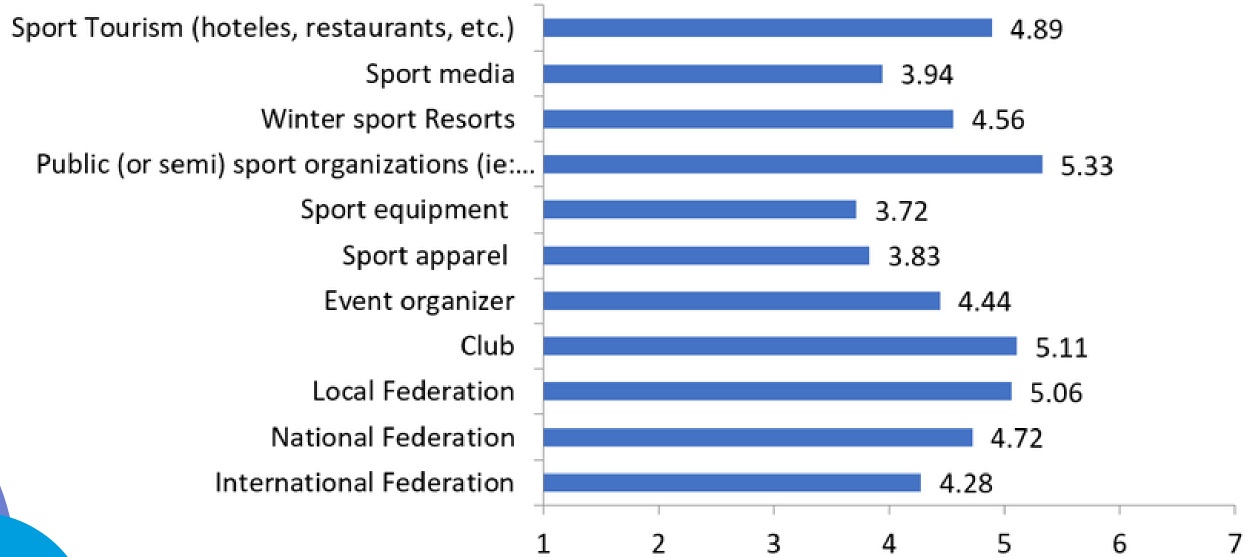
- UN Sports For Action Framework
- The Sustainability.Sport platform
- Green Sports Alliance
- Sports and Sustainability International
- Sport4Climate
- The Sport Positive Summit

Many of these organizations have a GloCal approach, integrating local action with a global impact. WMS could benefit from this approach. The Spanish Sports Association (ADESP) has made an attempt at this, by bringing together all the autonomous community federations to discuss topics of relevance regarding sustainability from a global, national and local perspective [10].

2. DIGITAL TRANSFORMATION IN WMS ORGANIZATIONS – THE GAP: WHERE WE ARE AND WHERE WE SHOULD BE



The diagram above illustrates the complex relationship between relevant stakeholders in the WMS industry. Respondents of the online survey were asked to rate the digitalization gap – comparing the current situation with the desirable one – of several different stakeholders (displayed on the diagram, except for innovators) (being 1.- minimum importance and 7.- maximum importance).



The study by Mastercard is a formidable example of the importance of considering all stakeholders' perspectives and needs to drive the industry forward: one of the main conclusions from their study pertains the importance of institutional support to technologically advance WMS. The research conclusions discussed in the previous section regarding where innovation and digitalization occur [3,4] in the WMS industry are supported by the aforementioned study and responses in this section. The WMS organizations with the smallest gap score in digital transformation are: sport equipment (3.72), sport apparel (3.83) and sport media (3.94). Public sports organizations (municipalities) received the highest score (5.33), followed by clubs (5.11) and local federations (5.06). It is interesting to note that the organizations in the industry with the biggest potential to influence innovation and digitalization are the ones considered to be the furthest from where they should be in that aspect.

WMS are worldwide wealth, employment and cultural impulsors. Over 60 million Europeans ski regularly, the slopes in the continent representing 62% of the skiing visits worldwide, generating 1.5 million jobs and 10 billion euros in revenue yearly [11]. These figures accentuate how ingrained in European culture this industry is, and how urgent the public's sector digitalization is in order to efficiently manage these seasonal sports' destinations. WMS resorts require high quality public infrastructure to be accessible and comfortable during peak season. Both private and public sport touristic elements must be able to accommodate a very large amount of people during a short period of the year. Digital innovation could greatly contribute to the "de-seasonality" of these destinations. Andorra, for instance, offers attractive touristic activities tailored to couples (via spa getaways and events), businesses (via their Innovation Hub and conferences organization), and families (via nature parks, attractions, family oriented events, etc.) year-round to ensure relevant economic activity occurs outside the standard skiing season, and to capitalize on the public infrastructure built for WMS peak season. This approach has proven to be successful in repositioning Andorra as a center of business activity in the sports sector.

In the USA, the Outdoor Foundation found a substantial increase in outdoor activities during the pandemic [12]. However, the post-covid era poses a set of challenges for outdoor activity that closely resemble those faced by WMS, both of which could benefit from digital innovation and implication from public institutions:

- Lack of diversity: from racial, disability and gender standpoints.
- Declining intensity: there are less intensive outdoor participants, but more casual ones. This is interestingly very similar to the trend perceived in sports regarding fan engagement: there is stagnation when it comes to avid sports fans, but casual fans are ever-increasing. WMS organizations have found strategies to drive up "casual" participation, especially when targeting specific segments.

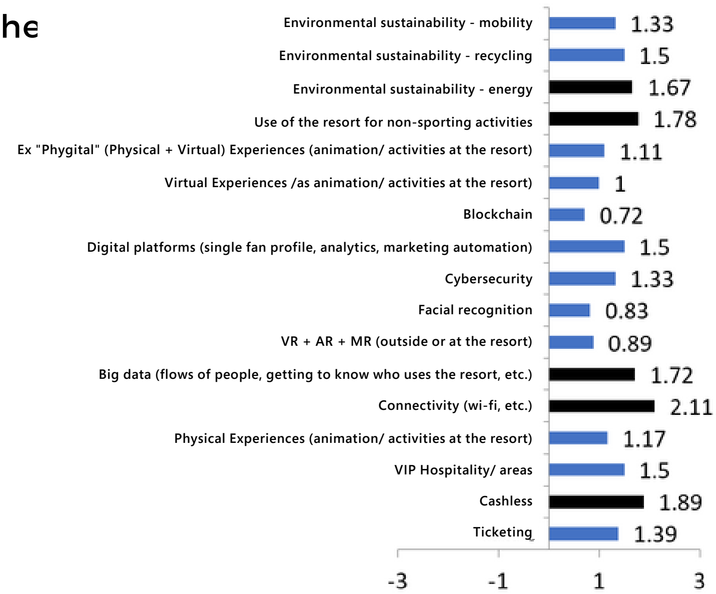
In essence, stakeholders must drive digitalization through the WMS destination's main objectives that pertain to them. This illustrates is the importance of an established and effective communication and collaboration framework between public-private sector organizations. The difference in agendas and timing of these two groups often results in tension, but in WMS the effectiveness of this communication is important. In WMS destination valleys, public and private sector are constantly interacting: safety and security, mobility, communication and regulation all have an important impact on WMS resort customers' satisfaction; The public infrastructure of WMS destinations must be adapted for peak season needs: roads, buildings, parking, safety measures, etc. If the public sector's perception of what the resorts require is too distant from reality, the consequences their decision making has can potentially be very negative. The near future foresees a shift and improvement in this relationship, accelerated by the devastating effects the pandemic had on tourism.

3. THE EVOLUTION OF WINTER & MOUNTAIN RESORTS – OBLIGATE DIGITALIZATION

Respondents to the Andorra Innovation Hub online survey were asked to rate the degree of evolution of several aspects associated to WMS resorts and their innovation. All the aspects were rated close to or over 1 on the scale of evolution (being -3 maximum decrease and +3 maximum increase), which might explain why the digitalization gap score was over 3.5 points for all aspects (suggesting a desire to further accelerate the digitalization of all sports organizations).

The topic areas with the highe scores pertained:

- Connectivity and practicality (cashless)
- Data and information collection
- Revenue stream diversification
- Energetic environmental sustainability



All topics mentioned are fundamental for Business Productivity and Insights not just for resorts, but for the WMS industry in general. WMS Resorts are evolving from simply offering WMSports to offering WMSportainment to their customers. The complementary activities surrounding resorts (spas, parks for children, food & beverage, apres-ski parties...) are becoming for the casual skier as important or even more important than the core activity itself. There are more people than ever going to WMS resorts, but the amount of times they go down slopes is decreasing, further illustrating the importance the whole WMS ecosystem has on Avid and Casual users' satisfaction.

	Location	Energetic Sustainability Strategy	Revenue Stream Diversification	Big Data	Connectivity	Cashless	VIP Experiences
Grandvalira		✓ Commitment with their providers. Slope maintenance is digitally monitored.	✓ Andorra hosts the multi-sport festival during warmer months. The Mon(t) Magic family park.	✓ Potential to innovate further.	✓ Within the resort and between other touristic aspects. Also used for safety.	✓	✓ Ski Premium and Mountain Club, among other. Potential to innovate further.
Vail Mountain Resort	Colorado	✓ They purchase renewable energy offsets. Recently purchased sustainable equipment.	✓ They offer all-season hospitality, corporate and activities.	✓ Pioneers. Offer life forecasts through EpicMix.	✓ Within the resort and between other touristic aspects. Also used for safety.	✓	✓ Vail Signature Club
Genting Resort*	Beijing 2022	✓ Applied due to Plympics. Low natural snowfalls requires abundant snowmaking.	✓ Potential to innovate further.	✓	✓ Within the resort. Also used for safety.	No information	✓ Wide array of Premium and VIP experiences
Trojena (project)		✓ Aligned with the SGDs.	✓ Close to the Red Sea. Has a lake for summer. Plethora of other activities.	✓	No information	No information	✓

*Information accessibility issues prevented from doing a through and complete search.

To understand whether these aspects are being prioritized by resorts and destinations, the table, displayed above, has been constructed with resort cases and projects:

The GSIC 2021 Report [3] on the sports industry and Digital Transformation asked participants the same question, yielding similar results. Overall, however, respondents in the present study were more pessimistic. Blockchain, virtual experiences, facial recognition, and VR were scored significantly higher by respondents from the 2021 report. This difference could stem from the dissimilar focus each report has. The table of cases (see table) looks into VIP hospitality experiences: they were considered to evolve positively to a higher degree by respondents from the present report, compared to the 2021 report. All of the resorts on the case table count with a VIP experience program.

The table, however, is non-exhaustive when it comes to WMS resort successful offerings. There are many highly successful resorts that have defined a specific type of consumer and tailored their activities to their needs and wants: Whistler and Verbier resorts skillfully de-seasonalize their business, with a wide array of summer activities. Serfaus-fis-ladis, in the Alps, has positioned itself as a family destination, tailoring their ecosystem to the needs of their target customers. Schladming has one of the biggest commercial offerings relative to the size of its town: 44 restaurants in a town of 6.5 thousand inhabitants.

A customer's experience and satisfaction with services and products at a resort can be affected by the following aspects:

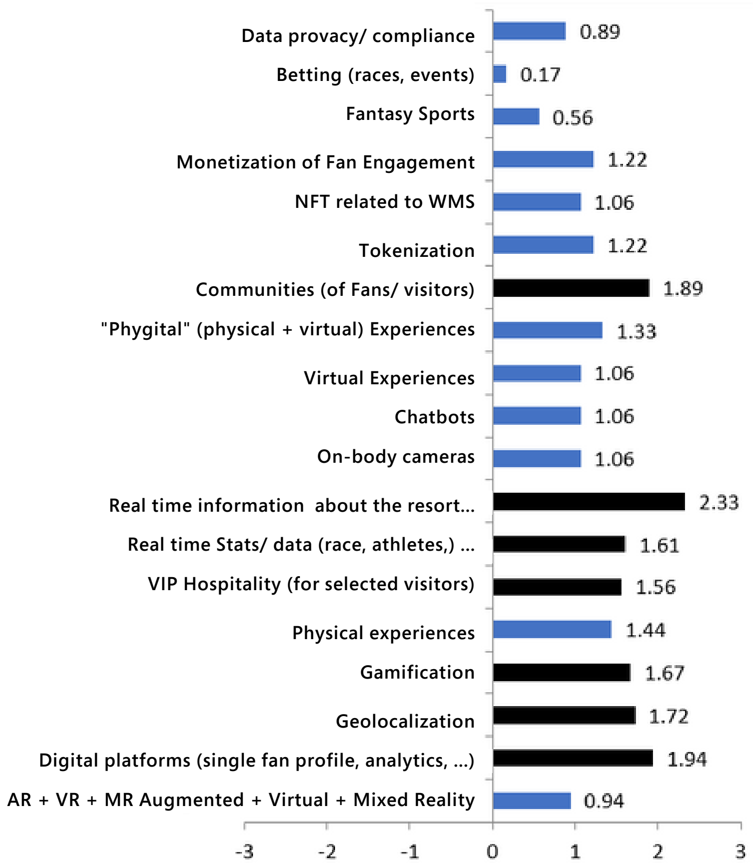
- Another customer: e.g. another snowboarder who either has correct slope etiquette or is snowboarding without accounting for anyone else's safety.
- Visible aspects:
  - Contact personnel: e.g. a good or poor customer experience at the lifts.
  - Service Providers: a professional or unprofessional rental equipment provider
  - Inanimate environment: the snow quality and quantity, the landscape, the state of lifts, the parking area and many others.
- Invisible organization and system: the back-office work such as maintenance, safety staff and IT staff to ensure the experience is streamlined and smooth.

Digitalization can be a part of all aspects of the model and can either be hygienic (smooth customer service experience, parking and payments) or motivational (unique experiences, affable staff).

The servuction model (created back in 1997 by Aix-en-Provence University, in France, Professors Pierre Eiglier and Eric Langeard) works closely with the customer perception model: satisfaction stems from expectations before an experience and the perceptions acquired after. WMS resorts have a complex customer perception ecosystem; the customers' final perceptions of the resort are very dependent on several uncontrollable variables (weather, snow quality and quantity...), as well as the public sector components (roads maintenance, cleanliness, safety, tax system, security, etc.), all of which bear a significant weight on customer satisfaction.

4. ENGAGEMENT - KNEE-DEEP INNOVATION

Respondents were asked to rate the degree of evolution of several aspects associated to WMS fan engagement innovation. The current legal frame for betting in Europe along with WMS belonging to the minority sports group, places betting at the bottom of all aspects' evolution pertaining engagement (0.17 points). Fantasy sports are similarly affected by the "minority" component. Yet, a fantasy platform for WMS, particularly for snow sports, is currently under development [13]. It is relevant to compile fantasy, gaming and gamification together when discussing engagement:



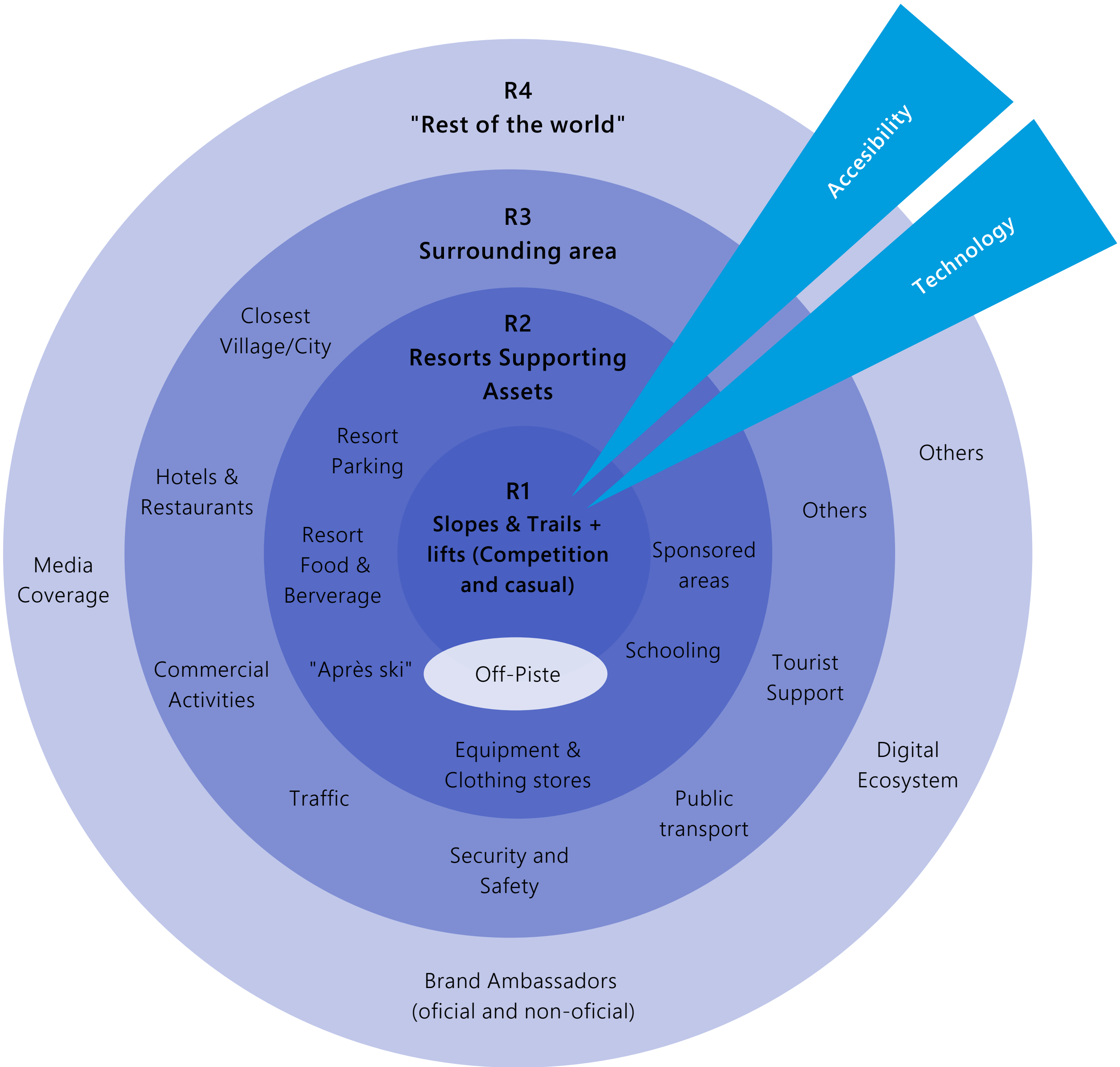
the FIS announced in 2019 a "digital-first" strategy [14], which included the development of a live fan engagement app gamifying FIS competitions, successfully launched at the FIS Cortina WC [15], as well as virtual game development possibilities [15]. In WMS, virtual gaming efforts are considered less relevant by most stakeholders within the industry [8].

One of the main priorities for WMS is to convert digital engagement into physical engagement – from Ring 4 to Ring 1 (see figure, created by SPSG) – to promote WMS destinations and the practice of WMS, therefore monetizing engagement. Virtual gaming does not currently contribute to the industry, notwithstanding it might in the future once the digital ecosystem is integrated with the physical. This is reflected in the top 7 aspects of the section (1.50 points and upwards); all of which require digital integration to evolve. Alpine and Nordic skiing have already taken a step in the gamification aspect of innovation, some resorts developing gamified circuits for skiers to enjoy (e.g. Sierra Nevada Audi Ski Run). Innovating further by, for instance, providing a ski slope with a VR headset, can allow the same physical slope to provide entirely different experiences for each skier.

NFTs and tokens are experiencing a period of substantial growth. Despite their lower scores compared to the 2021 GSIC Study, where tokenization received a score of 1.77, results indicate potential long-term use and success of these assets in the WMS industry (1.06 and 1.22 points, respectively) [16]. This could could alternatively mean that in the Winter and Mountain Sports ecosystem it is more difficult to successfully implement tokenization and NFTS. Backstage, a company specialized in blockchain, recently partnered with the "après ski" Sun and Snow Festival in Sierra Nevada, implementing blockchain technology in the ticketing and merchandising payment processes [17]. This reduced counterfeiting and provided a more transparent and secure buying experience. Additionally, Backstage aided in the generation of NFTs associated to the event and participating artists, available on their platform, which aimed to increase customer expenditure and engagement. Another example can be the NFT launch by Henrik Harlaut, a successful X Games skier [18], equivalent to collectible trading cards. Media NFTs, such as the aforementioned, provide consumers with an interesting format of a collectible. The permanent nature of NFTs has developers treading cautiously when determining the content and benefits associated to this type of token. Tokenizing assets without using blockchain is a possible and much safer strategy at the moment, especially given most sports fans want the tokens to provide them benefits; namely voting rights, exclusive discounts, priority access to tickets and competitions, as well as access to athletes [19].

Sports fans are very receptive to sponsorships, an 81% stating they trusted sport event sponsorships [19]. This provides sponsors with an opportunity to activate their sponsorship through tokenization, utilizing it to bridge the gap between consideration and conversion.

The 2022 Beijing Winter Olympics and Paralympics are an example of accelerated digitalization of fan engagement, providing fans with extensive data, social media interaction touchpoints, VR experiences, the Fan Wall to support athletes, as well as GloCal incentivized participation in virtual challenges, driving interaction further. Data collection, real-time information (for competitions and for resorts) and community generation are – and will be – paramount in the development of long-lasting relationships with users and fans. The relationship between engagement and satisfaction is a close one (see figure on the following page): the key indicator of successful engagement strategies is the increased satisfaction, and consequent monetization, of the engagement experiences. Aligning it with a solid, cohesive, and believable positioning is paramount

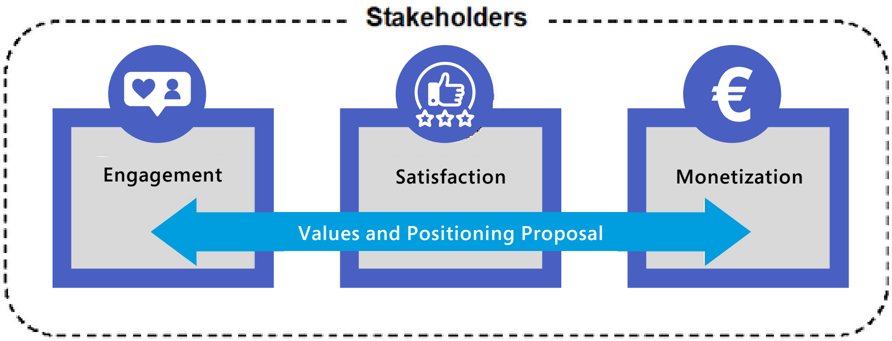


With growing relevance of phygital experiences, engagement assumes a very hybrid presence. WMS Resorts could apply the 4-ring model (4RM, created by SPSG Consulting, discussed in [3]) to the unique characteristics they present. An adapted version of the 4-ring Model for an All-Seasons WMS resort can be seen in the figure.

Off piste lies between Ring 1 and Ring 2 because it presents uniquely within the model: It often relies on ski lifts to be accessible for those who want to practice it and it is present in competition via The Freeride Tour. However, the nature of this sport and the "unkempt" conditions it requires, do not allow for its meticulous or direct management by the resort.

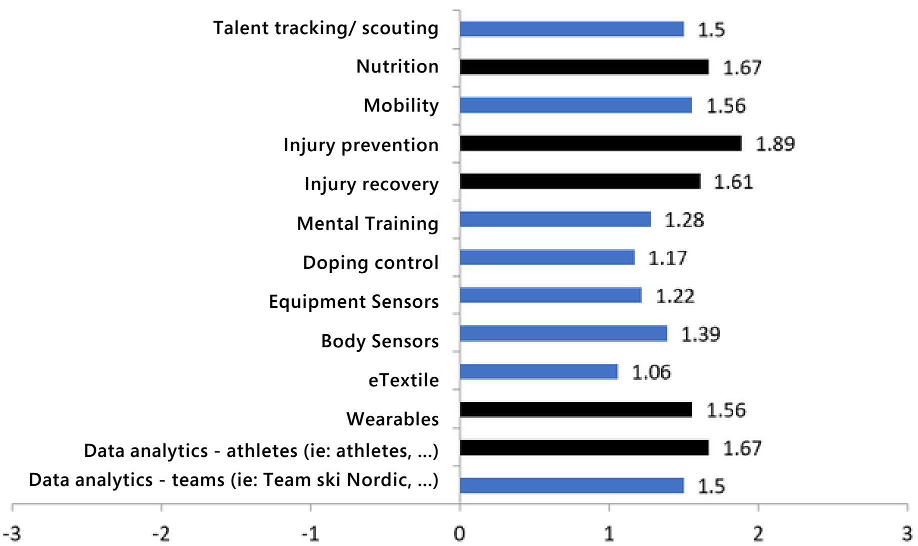
When engaging with potential users and customers within any one of the rings, technology/digitalization and integral accessibility play a transversal role in the success and sustainability of engagement: a well-defined strategy encompassing both aspects is necessary.

Additionally, closely associated to the 4RM are relevant stakeholders – or "contributors" – to each ring. For instance, resort snow and lift maintenance staff, as well as other resort users are relevant to R1. A digitalization strategy must account, as per most business strategies, for these "contributors" to ensure a smooth experience through and within the rings. Moreover, and as introduced before, the role to play by public entities is key, as they are pivotal part of the "valley" concept (which is linked to R3 and R4).



Mayasuki Yoshida's perspective on engagement is very useful to summarise the purpose of fan engagement initiatives [20]. They can be designed to elicit non-transactional behaviours (e.g. engaging in the comment section, liking of saving a post), transactional behaviours (e.g. buying a forfait for 2 days of snowboarding), or long-term relationships (e.g. buying a season pass for a resort, returning in the summer). These three aspects highlight the importance of monetizing engagement, always aiming for either ROI or ROO.

5. WMS ATHLETE PERFORMANCE – BUILT TO WIN?



Respondents were asked to rate the degree of evolution of several aspects associated to WMS athlete performance innovation. The scores, all over 1 point, highlight the accelerated innovation the industry has experienced in recent years in this sector, evidenced by the pre-pandemic resort visit figures, especially the successful 2018-2019 winter season [1] and the certain innovation in the years to come.

Health and safety aspects of innovation were considered most relevant: nutrition (1.67 points), injury prevention (1.89 points) and injury recovery (1.61 points).

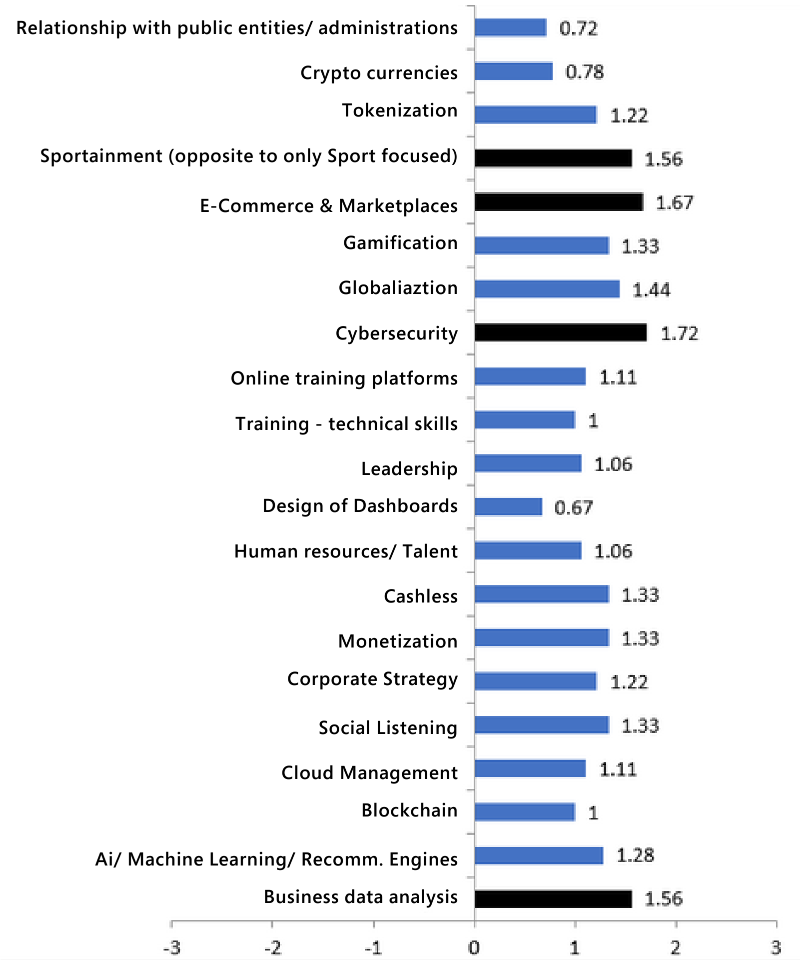
Altitude and cold weather are contributing factors to the differentiated diet WMS athletes follow: eating often, energy dense foods, iron-rich foods and drinking often are some examples of nutritional considerations for WMS athletes [21]. Digitalizing this aspect via, namely, wearables (1.56 points), could increase athlete performance. An example of digitalized and sophisticated nutrition is the one developed by Macco Robotics: one of their aims being to develop robots able to cater to and personalize each person’s nutritional needs to the highest degree of accuracy possible.

Safety has become increasingly important for both casual WMS athletes and professional athletes. Climate change is partially responsible for increased injuries and accidents in snow and mountain sports [7]. Moreover, casual skiers are becoming more adventurous going off piste, and taking more precautionary measures, especially through wearables, when doing so [22]. One of the finalist startups of the Andorra 2021 startup challenge attempts to approach and resolve the issues regarding these aspects: FIT Mouthguards alert the user or people around them if someone has received an impact over a certain safety threshold via light and sound signals, as well as collecting and storing on a cloud the information from the impact. Closely related to cloud storage are data analytics, which share the podium with nutrition and injury prevention, with a score of 1.67 points. Real-time and readily available performance data will continue to transform the industry and contribute to improved athlete performance. Almost half of the startups in the industry regard platforms, apps and wearables [22.1]. Additionally, sports data is now being used to forecast and predict wins, with varying degrees of success [23].

Experts have identified a trend in the casual skier population with soft ski material, where casual skiers are prioritizing comfort, aesthetics and versatility in their soft equipment more than the extremely technical aspects professional athletes might prefer. This trend is to be considered by brands that cater more to this type of skier in order to reduce technological development costs.

Integrating collected data from several sources, together with predictive and reflective models into the digital cloud ecosystem, and tailoring it to the athlete's needs, will provide users with currently unbeknownst insights. Early WMS talent detection and development systems have not yet been developed to the level of sophistication seen in other sports, an aspect considered relevant for respondents (1.5 points), which could indicate potential short to medium-term evolution.

6. EVOLUTION OF BUSINESS INSIGHTS AND PRODUCTIVITY - PEAK PERFORMANCE NEEDS



The increased digitalization of sports businesses is evidently leading to higher levels of preoccupation with data safety and cybersecurity, thus, it is not startling to see cybersecurity with the highest evolution score (1.72 points).

A busier and more demanding pool of users and consumers pushes businesses to deliver smooth and fast transactions. Dynamic pricing has been successfully implemented in the industry, and when effectively managed, greatly increases productivity. The WMS businesses' structure should account for the change in customer needs and wants, redefining their strategy and redesigning their operations.

Alibaba cloud is a successful example of business productivity shift, becoming the “digital backbone” of the Beijing Olympic Winter Games in 2022, streamlining digital processes and providing the user with a smoother experience [24]. However, Alibaba’s function was, as mentioned, to act as a backbone. OBS, Intel, Comcast and OMEGA among others, were some of the parts involved in compiling, providing, and engaging with consumers through this streamlined process [25,26]. Microsoft Azure provides similar, but much more consumer-tailored, services on a regular basis: Renault Sport F1 and NASCAR make use of Microsoft’s Cloud services to improve their performance and efficiency from an athletic and a management perspective.

Cashless will also become an established “hygiene” factor for consumers and users. The NFL is turning the SuperBowl cashless through a partnership with Visa, after a study showed expenditure in venues increased when operations were cashless [27]. An add-on only attributable to WMS is the constant requirement to update and improve on their forfait technologies and packaging. The recent development and establishment of contactless forfaits proves there is still room for innovation. An innovation for Vallnord and/or Grandvalira’s forfait offers would be to include F&B within the forfait. Additionally, resorts have begun to rethink how to offer contactless and paperless forfaits. In the cold, mobile devices can be unreliable. Experts are considering alternative technologies e.g. facial recognition, for an increasingly frictionless service.

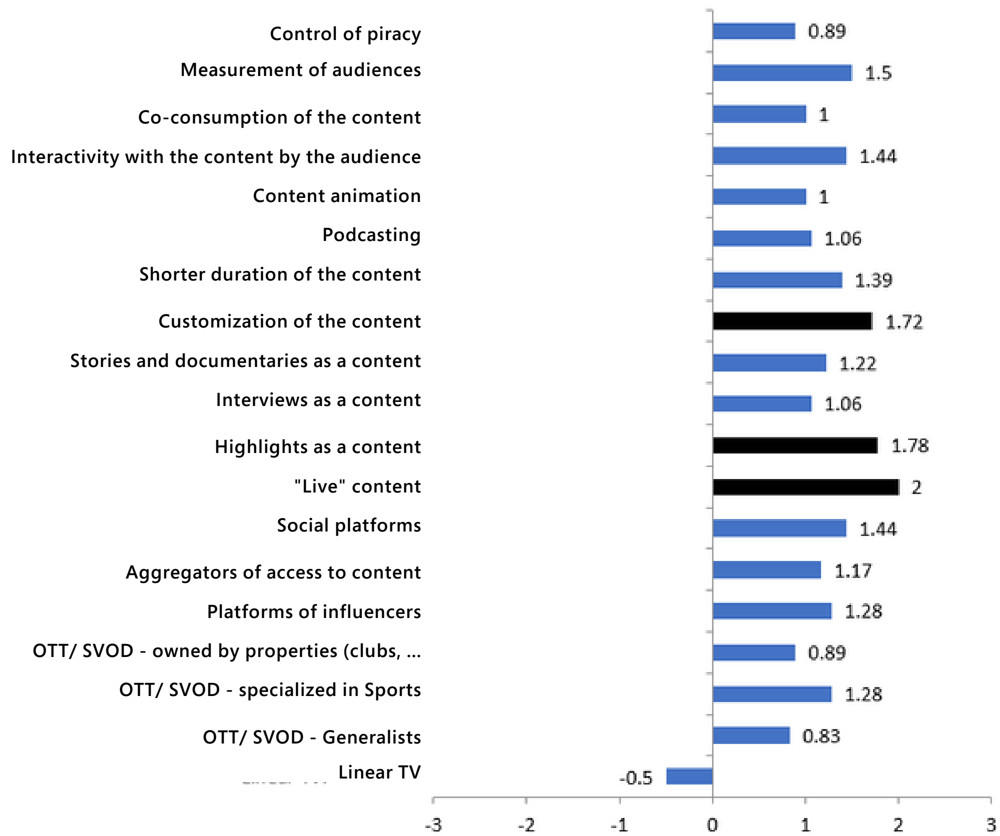
WMS’ complex infrastructure and ecosystem make business productivity and streamlining a daunting task. The ecosystem should be conceptualized as a single “business” in order to identify cloud and productivity needs, analyze data and define the destination’s strategy. Andorra’s size gives it an advantage over other WMS destinations: its government can easily adapt to the businesses’ needs for growth and communication between stakeholders is much more fluid during decision-making.

Going to a WMS destination is a clear example of Sportainment: it does not just englobe watching or practicing the sport, but also planning meals, other activities during the day and even going to an “après ski” event. All of these involve expenditure and several important business processes that need to flow smoothly to ensure maximum user satisfaction is achieved. An incidence in one of the components of the “single business” ecosystem can deter users from returning or recommending the destination. A cohesive identity and quality control is of great importance. A real-time information system of weather, food and beverage availability and avalanche risks, is being constantly updated and improved for consumers to have the smoothest and most satisfactory experience possible.

Furthermore, the ecosystem's procedure's structure should enable providers and users to customize their experience according to their preferences and situation. VisitAndorra is beginning to tap into the potential of streamlining processes and WMS destination ecosystem cohesion by providing accessible resources to potential visitors through their website [28].

Ultimately in WMS, the development and improvement of integrated systems that can cross reference data from snow-quality checkpoints, lift availability, traffic...etc. and make it easily available for all stakeholders will be at the front of the industry's digital transformation.

7. THE DEMOCRATIZATION OF MEDIA AND "NEW MEDIA" – THE CONSUMER DECIDES



Globally, the Entertainment and Media (E&M) industry is set to grow at a CAGR of 5% between 2021-2025 [20,29]. This overall figure seems pessimistic, but there is recent information pointing to a plateau in E&M rights prices in the short to mid-term [30].

Media exposure is, for all sports, a fundamental driver for either revenue or notoriety. The appearance and growth of "New Media" (social media, OTTs, SVODs...) has democratized the Entertainment and Media (E&M) industry, empowering consumers to an extent where it is damaging for the media providers: consumers have become habituated to constant innovation and quality content production, so when a competitor offers something more valuable, the consumer can swiftly change. This has led to substantially high churn rates for SVOD platforms and OTTs; the consumer is more demanding than ever. For WMS, the democratization of media and its much more segmented consumption can be an opportunity: Stories and documentaries (1.22) have not been considered as relevant for the future as other aspects of media (compared to other sports). This, however, should not deter producers from creating this type of media: The Golden Trail Series adopted a documentary/stories format for their highlight reels (1.78 points) of the 2021 Golden Trail World Series, showing a raw, high production value and even unfair side of the sport. This series of YouTube videos amassed in total over three million and four hundred views, a feat for a niche and slow-paced sport like trail running.

Live content (2 points) will probably always be relevant, especially at a time when trends are changing faster than ever. However, if the audience does not interact with the content in a way that can increase notoriety for the sport or drive sales, the cost of live TV of live online-TV is too elevated to be of use. The Beijing 2022 Winter Olympics and Paralympics, together with their digital partners, turned the event into an immersive, gamified and interactive experience for both live and deferred coverage: elements of the Winter Olympics could be watched in 8K VR live and real-time, never-before seen data was available to drive engagement, among other actions [25]

Content is king, and the shorter the content the better, according to recent trends in consumer habits and growing social media platforms with shorter content formats (e.g., TikTok, Instagram reels, YouTube shorts...). Generation Z is currently the main focus for media outlets: they are "digital natives" of very attractive ages for engagement strategies. Generation Z prefers the online version of TV + streaming platforms to watch live content [28], which opens up possibilities for WMS content development and streaming at a lower price.

They have values and interests aligned with the industry, according to a GWI study:

- 48% enjoy travelling
- 41% like playing sports
- They want brands to be both trendy/cool (37%) and smart (47%)

All these apply to WMS, but the industry needs to amplify them and design effective content and communication strategies to generate awareness.

An aspect GenZ considers very important is their relationship with the brand. They follow influencers more than sports teams, brands and TV channels. Influencers are formidable channels to communicate with consumers: they humanize brands and are closer to consumers. See for instance snowboarding star Shaun White, one of the WMS athletes with highest sponsorship value and engagement scores on social media, according to SponsorUnited. In fact, this is further justified by the aforementioned GWI GenZ report, that found 37% of GenZers wanted to feel valued by the brand, and 30% wanted to be offered customized and/or personalized content.

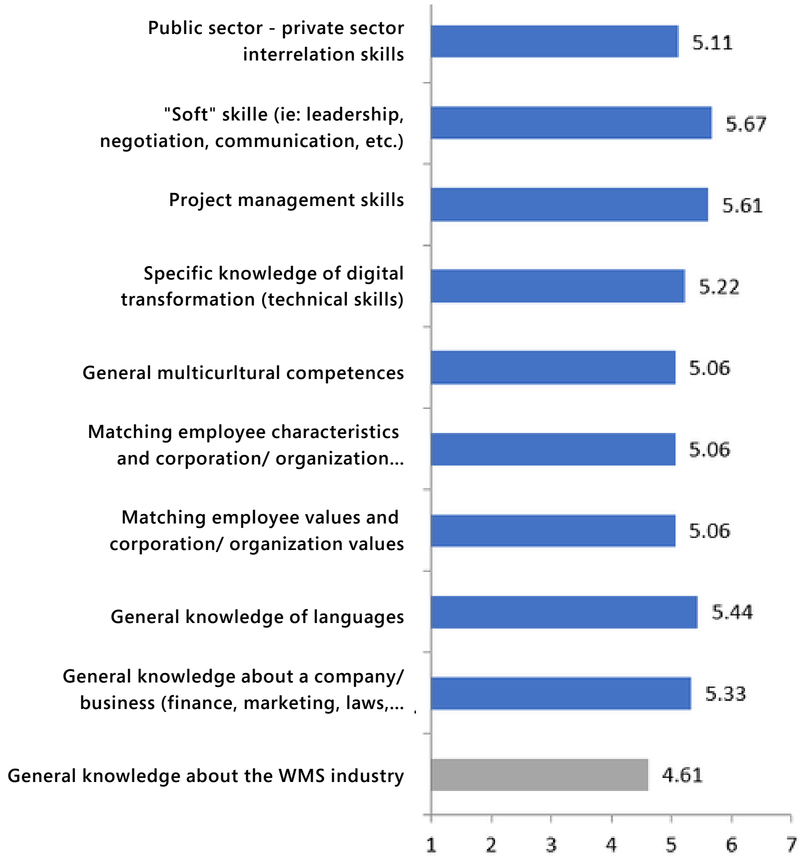
Thus, the apparent key to media's and new media's success is to engage with consumers through their content in a way that elicits a sense of belonging: Formula 1 has achieved this very successfully, creating a "universe" [20] including documentaries, live competitions through different channels, a fantasy game , social media engagement strategies, etc. This can lead to decreased churn rates in SVOD platforms, increased microtransaction possibilities and ultimately, the conversion of fans from casual to avid fans.

It is still of prime importance to continue developing, especially in the short term, a variety of entry points to live sporting events; packaging subscription models as segmented and varied as possible [30], allowing for efficient monetization.

8. DEFINING SKILLS AND ATTRACTING THE TALENT – A STEEP SLOPE WITH OPTIMISTIC OUTCOMES

The impact of sport on the EU economy appears small: 1.3 million European citizens are employed in sport, a 0.7% of total employment, many of those are men, and 40% of them all have completed tertiary education [31]. 7 of 1,000 EU citizens economically depend on the sports industry. The indirect jobs and temporary jobs the industry generates are not accounted for and should be. The real impact of sport is visible when indirect jobs and temporary job roles are included in the count. In terms of GDP, it accounts for 2.12% of the European Union (before Brexit) GDP.

Two questions and their respective answers conform this section. Defining skills required for a role cannot be discussed clearly without diving into systems to attract and retain talent. Respondents were asked in both instances the degree of importance specific aspects - pertaining working skills and talent attraction – would have in the near future on WMS.



All the skills listed received an average score of over 5 out of 7. The only exception might seem surprising: having general knowledge of the WMS received a score of 4.61 points, the lowest. A trend prioritizing transversal, digital and soft skills has been gaining traction the past few years, and it appears will continue to gain relevance in the near future. Digital transformation requires digital knowledge, but also a set of skills easily transposable and adaptable to a changing environment. This is especially true in startups, where digital transformation occurs more often and at a faster pace [32]. General knowledge of Languages and Project management skills were considered more relevant by respondents from the present study than by respondents from the GSIC Workforce report, which evaluated sports leaders from several sports industries [32]. This is perhaps due to the destination component of WMS (multicultural) and the complex infrastructure surrounding the industry (project management), both of which require more experience in these skills.

The GSIC 2020 Workforce report also analyzed the most valuable soft skills for sports leaders in detail. When the information was segmented into the most frequent job roles within the industry, differences in the prioritized soft skills could be found. Overall, the most valuable soft skills in sport on average were teamwork, leadership and analysis.

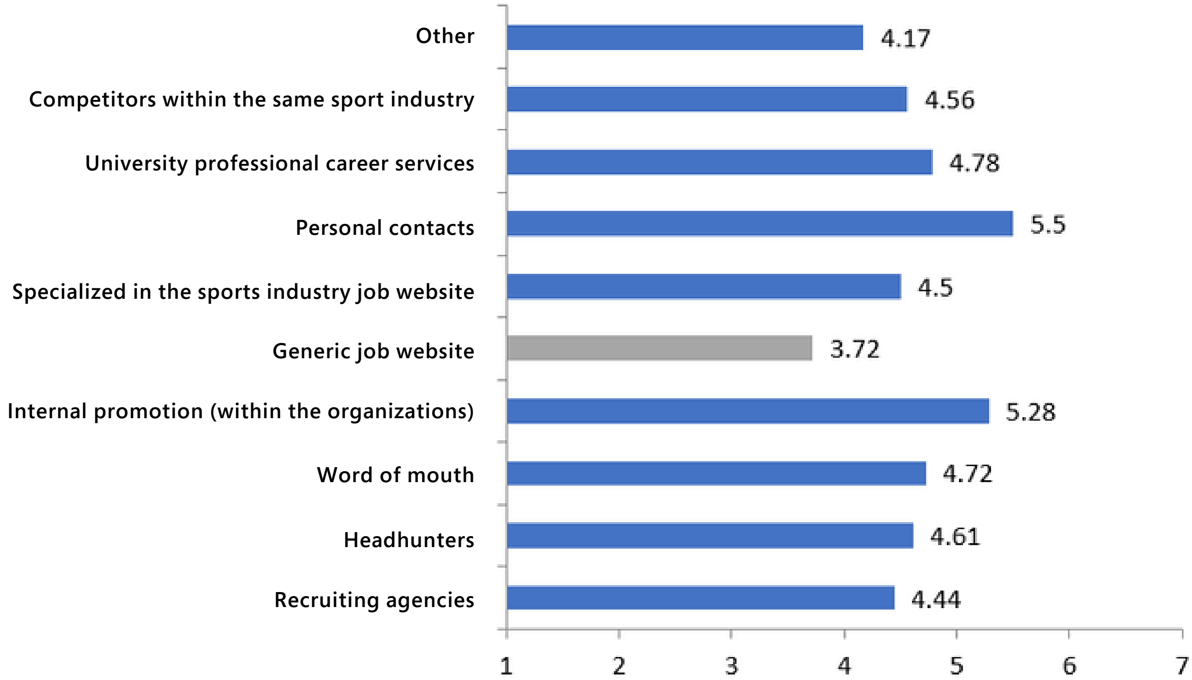
These responses do not deter much from the global workforce market. McKinsey extensively studied the workforce market, defining by then a set of essential skills that would enable workers to:

- Add value beyond what automated machines can achieve
- Operate in digital environments
- Be adaptable to new working methodologies and roles [33]

The WMS industry has a variety of job roles and types: public sector, catering, photography, technician, instructor, resort manager, resort designer, marketing and sales, rental tech, events specialist, etc. [34] Some of these roles require a set of specific, technical skills. The high score of language knowledge can also be justified here; instructors, catering, resort managers, sales department employees and event specialists are some examples of WMS jobs that would be benefitted by an employee who knows more than 1 language.

A relevant insight from the 2020 GSIC report on Talent in the general sports industry mentions that according to sports leaders, the soft-hard skills "package" taught by sports universities is not sufficient from a digital transformation standpoint. The curricula have now slightly adapted, and relevant institutions e.g. LaLiga Business School, Johan Cruyff Institute, Escuela Universitaria Real Madrid, CIES, etc. do integrate necessary skills for digital transformation into their masters teaching. Some, but not the biggest institutions, have even included lessons or full modules to account for sports with a "destination" component, including languages, sports tourism and project management. However, there exists a gap in talent development in the WMS Industry that these specialized sports business institutions cannot cover: STEM. The industry must attempt to generate attractive opportunities for STEM experts to work in WMS. GSIC is doing this from a business and entrepreneurial perspective, but there is an underdeveloped need to also educate in STEM applied to WMS.

In addition, the industry is experiencing a transformative period. Trends are ever-changing, technology constantly improving and digitalization evolving up to a point where it can be overwhelming for new workers to consider themselves qualified enough. Affordable and high-quality lifelong education (via conferences, courses, certifications and others) will be paramount for the WMS industry to innovate, and ultimately retain talent [33]. Fundamentally, most sources of human resource expertise coincide: soft skills and project management remain as the recruiters' priority, as seen in the 2020 GSIC report on Talent.



When attempting to find talent, university professional career services were considered more relevant by respondents from the WMS industry (4.78 points) than by respondents from the GSIC 2020 Talent in the Sports Industry report. The increasingly professionalized system and network within and between sports educational institutions has proven to be very effective in detecting and employing talent in recent years. Regardless, personal networks and internal promotion remain at the top, with scores of 5.5 and 5.28 points respectively. This aspect is probably relevant in minority sports like WMS because despite the global aspect of the industry, the amount of people working full-time is limited. LinkedIn was considered in the aforementioned survey, not the current one, and occupied a top-4 spot. In this case, the social media platform has the lowest score (3.72 points). Again, the pool of available jobs and the size of the industry might be able to justify this. Another aspect of digital platforms is the fact that algorithmic and search filters might hide from employers talent with substantial working potential.

Attracting talent, especially in the current global economic situation, is not a hard feat. However, retaining talent is becoming a priority for companies. Younger generations are becoming less loyal: 41% of current employees are considering resignation [35]. Their priorities have shifted as well; they want to work with purpose, to have a healthy work-life balance, to feel valued, have a sense of belonging and have the potential to grow [35,36]. This last aspect is becoming an issue for lower income and more hands-on jobs in the sports industry. Snow sport instructors, rental technicians, hospitality staff... all these jobs have very high rotation and little projection. Educating, evaluating and defining progression strategies for employees in these roles within the industry could potentially increase the quality of services provided, employee satisfaction and employee retention rates. A strong purpose and value proposition should now be prioritized. To illustrate this, 67% of job seekers consider a diverse workforce an important factor when they evaluate companies. In fact, a business with diverse working environment has shown to outperform other businesses by 35% [37]. The seasonal nature of winter sports makes talent retention, especially in hospitality, a challenge. Everything cycles: de-seasonalizing businesses in and around the WMS industry can enable businesses to develop more varied, attractive and secure job roles for potential talent.

To further professionalize and digitalize the industry, solid and evidence-based employment and talent retention strategies are to be implemented by WMS businesses. Looking into other relevant industries' talent should be normalized: the beauty of sport is it has an emotional component and transcending purpose that can provide potential talent with great satisfaction. Industry-specific skills can always be taught.

9. TAKEAWAY MESSAGE

7.7% of the Andorra GDP is generated through the sports industry (in comparison to an average at the European Union of 2.12%, before Brexit). Thus, the industry is extremely important for the country, where Winter and Mountain Sports are, along with Cycling, the main sport activities.

The collateral effects of Covid19 hit the Andorra Sport industry. However, its recovery is strong and robust. One reason being, in general, but also applicable to Andorra, the digital transformation of the sector is a reality, despite the fact that, worldwide, there is still substantial room for improvement (especially in public and semi-public organizations).

Winter and Mountain activities have clearly evolved from a "sport" to a "sportainment" dimension, where connectivity, big-data, real time information about the resorts, the creation and development of communities (instead of just ski and mountain practitioners) and , of course, full respect to sustainability (environmental, social and economic) are the key factors to succeed.

The WMS industry is one of the many "sportainment" sectors in the midst of a transitional and digitalization era. The future seems daunting, especially with the younger, much more unpredictable generations coming. The complex ecosystem of WMS destinations, the long-list of stakeholders, public-private interactions, business productivity needs and sports holds incredible innovative potential. Formidable positioning and innovation examples already exist within the industry, but a need for a more seamless, customizable, sportainment-focused, de-seasonalized experience for all consumers, is still very much a priority. Fostering an environment where communication, digital innovation, and education occur simultaneously is driving, and will continue to drive, this industry forward. And Andorra, the country in the Pyrenees, is taking the right steps to be at the front of the pack, and contribute, with real added value, to the future of the Winter and Mountain Sports worldwide.

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