Healing Alps:
Tourism based on natural health resources as strategic innovation for the development of Alpine regions
ASP815

Synthesis Report on HEALPS' main outputs: WP 5: Technological Aspects

WP T1:
Assessment of Alpine regions' Health Tourism Policy and Development Process

D.T1.1.1:
Synthesis report on HEALPS' main outputs (III/IV)

Project Partner 3
National Research Council
Institute of Intelligent Industrial Technologies and Systems
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Content

1 Report context

The present synthesis report summarizes the results of work package 5 within the ARPAF project HEALPS for the integration in the Health Tourism Assessment and Benchmarking Tool (HTAB) of the Project HEALPS2. The analysis was carried out by the Institute of Intelligent Industrial Technologies and Systemsfor Advanced Manufacturing at the National Research Council.

1.1 ARPAF project HEALPS

HEALPS was a project funded by the Alpine Region Preparatory Action Fund (ARPAF) and built the base for the Alpine Space Project HEALPS2.

Project Title:

HEALPS - Alpine Health Tourism – Positioning the Alpine region as globally attractive health promoting place

Project Partners:

- Innovation and Technology Transfer Salzburg (AT, Lead)
- Foundation Cluster Technologies For Living Environments (IT)
- University of Applied Sciences Chur (CH)

Funding:

The project is co-financed by the European Union (Alpine Region Preparatory Action Funds - ARPAF)

Start and closure dates:

January 2018 to June 2019

Project Outline:

Outdoor recreation in natural environments is becoming an important aspect of healthy living and a remedy against the deficiencies of urban life separated from nature. With its exceptional nature, cultural heritage, healthy climate and long tourism tradition, the Alpine region possesses significant prerequisites to benefit from this trend. However, to date there is no awareness of the unique health-promoting potential of the Alpine region. Major reasons for this lack of awareness are insufficient visibility and knowledge of health-promoting Alpine assets.

In contrast to the current, fragmented approaches towards the promotion of Alpine assets, the project HEALPS aims to develop a common basis for the positioning of

the Alpine region as an attractive health-promoting place through data compilation, generation and the visualisation of unique Alpine assets related to health. The project incorporates four different perspectives: Alpine resources, customers and providers as major stakeholders, education and technology.

This approach addresses EUSALP's strategy of a better utilisation of Alpine-specific resources and creates a basis for the development of Alpine health tourism value chains to drive job creation and growth in remote Alpine areas. In this way, it counteracts depopulation in these areas through new business opportunities and positions the Alpine region as healing environment for tourists and as an attractive environment for working and residing. The project covers six work packages.

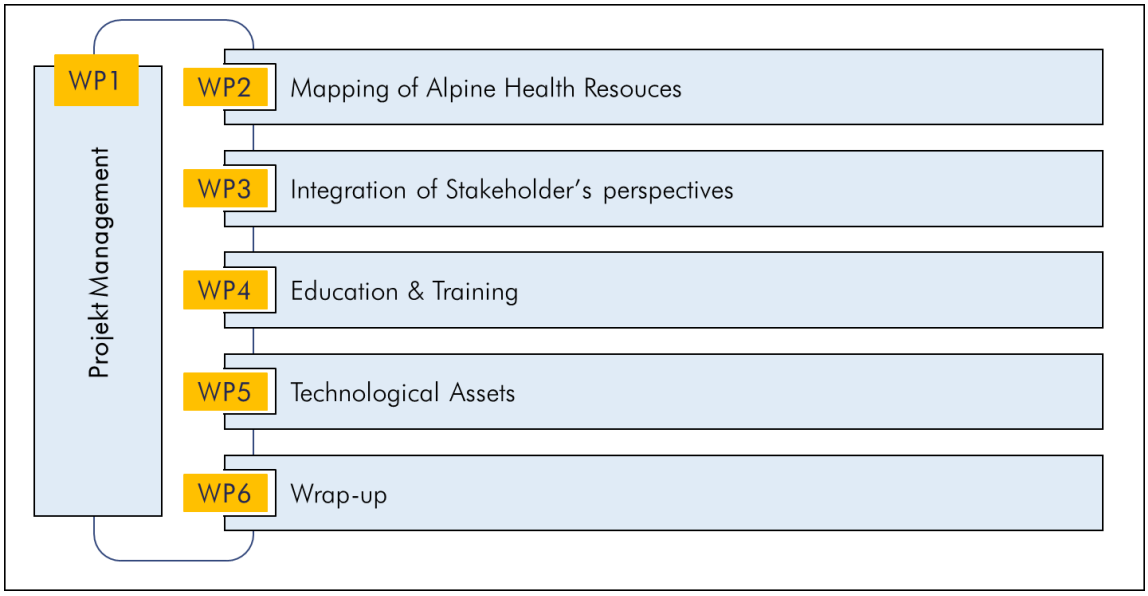


Figure 1: HEALPS work packages

1.2 Alpine Space Project HEALPS 2

Tourism is a major engine for job creation and a driving force for economic growth and development in the Alpine programme area. Yet alpine tourism is currently experiencing challenges such as climate change and is often only focussed on specific regions. Global trends such as a thirst for nature-based experiences and increased health consciousness hold considerable opportunities for developing innovative nature-based health tourism experiences. To fulfil this potential, the project will provide policy-makers, regional developers, Alpine regions and SMEs access to innovation knowledge and to implementation tools.

Building on the ARPAF project HEALPS, the aim is to improve framework conditions for utilising Alpine natural health resources by developing health tourism products and service chains. Lessons learnt from existing innovative, but fragmented cases will be elevated to a transnational level. Supported by the combination of the latest research results with digital solutions, the nature-based health tourism approach will be tested in pilot regions and the experiences then translated into relevant tools for Alpine regional development. By engaging quadruple helix stakeholders, cross fertilisation between tourism, health and other relevant sectors and co-learning is stimulated at transnational level. This shared knowledge at various scales facilitates framework conditions for value generation based on location-bound Alpine assets.

Recommendations for different policy levels as well as guidelines & implementation toolkits for product and service chain development reflect the purpose of a broad implementation of hands-on knowledge for the stimulation of SME- and destination driven innovation. Two international conferences on Alpine health tourism will allow transnational & transversal knowledge transfer from academia to regions and SMEs. Thus, the project contributes to the positioning of the Alpine Space as globally attractive health promoting place.

HEALPS2 lasts from October 2019 to June 2022 and is co-financed by the European Regional Development Fund through the Interreg Alpine Space programme (Total budget: 2.169.952,65€ - ERDF grant: 1.844.459,74€).

2 Identification of existing technologies and good practices for assessment, measurement and visualization of Alpine Health Assets

As identified in WP2, the Alpine region shows great assets that make it a very interesting destination for the health tourism. In particular, the most relevant health promoting factors that have been identified are multiple and vary.

2.1 Health promoting factors

- Air Ions: the high concentration of negative ions in the air has been proven to be beneficial to people health.
- Greenspace / Blue spaces / exercises: the presence of nature can increase the quality of life significantly.
- Attractiveness of landscape: people are attracted by the unsoiled landscapes that can be found, for example, in the mountains.
- Hiking paths: the presence of particularly spectacular hiking paths can be a source of attraction for visitors that are drawn in by the beauty of the landscape as well as by the positive effects that long hikes generate over human body
- Biodiversity: great biodiversity testifies a good ecosystem in which the presence of harmful characteristics is minimal or non-existent.
- Nutrition: the high quality of the local food can be attractive for tourists while promoting a healthy diet

2.2 Factors hazardous to health:

Fine dust concentration: the presence of fine dust in the air in high concentration is very common in the cities. The fine dust, which is mixed with the air we breathe, can create very sever health conditions and diseases.

Noise pollution: is commonly present in the city. This form of pollution, which is sometimes overlooked, can be very dangerous for people's health, both physical and psychological.

Crowding: the excess of density of population in the city areas significantly increases the level of stress.

2.3 Technologies identified:

The technologies with the highest potential impact have been identified. Among all the identified one, few were selected to be used in the pilot study, in order to evaluate the effects of the technologies over people interests toward hiking in the mountains.

Methodology:

- Step 1: Creation of a focus group
- Step 2: Carrying out multiple pilot studies

2.4 Focus groups with relevant stakeholders

On the 10th of April 2019, a Focus Group was organized at the University of Milan Bicocca with the following topic: "The alpine region as both a healing and entrepreneurial space: multiplayer perspective pathways". The focus was on the possibility of identifying and creating technology-enhanced services for health-based tourism in the alpine area.

2.4.1 Context

The context of the Focus Group started from the assumption that spending quality time in the nature has become one of the most important remedies against the discomfort and the pathologies associated with life in the cities. Thanks to its naturalistic and cultural assets, the peculiar weather and a deeply rooted touristic tradition, the alpine area represents a great destination when it comes to alpine health tourism. Nevertheless, nowadays, this great potential has yet to be fully exploited, mostly due to the lack of visibility and knowledge regarding the positive health effects linked to a vacation in the alpine area. The Focus Group focused, therefore, on identifying an organic and vastly shared approach to the valorization of the alpine area.

2.4.2 Nature-based health tourism

The Focus Group started, first of all, from the concept of nature-based health tourism, trying to achieve a definition that would be comprehensive of all the multiple aspects that comprise this complex phenomenon. As for its name, nature-based health tourism must start from scientifically proven naturalistic assets that contribute to people's wellness. Services must be built on top of these assets to exploit and valorize what is already offered by the geodiversity, the weather, the local food etc.

These services must be oriented especially toward fragile people, such as chronic patients or people with disabilities. Coherently, the long-term goal must be a full understanding of how natural resources of the Alpine area could be exploited as therapeutic assets to heal complex chronic diseases, such as respiratory or circulatory diseases.

2.4.3 Focus Group specific goals

Draw a complete schema of the alpine tourism's state from multiple point of view

Identify the opportunities and the challenges linked to the development and empowerment of the health-based tourism, with a special focus on who technologies could help

Explore which are the fundamental requisites for the active use of technologies in this context, especially in terms of opportunities and limitations

Draw a road map of the opportunities and of the relative costs that would foster an economic grow of the health-based tourism in the alpine area.

2.4.4 Participants

The Focus Group has seen the participation of the Welfare General Director for Lombardy region, as well as clinicians from three different hospitals and clinics. Representatives from the Italian Confcommercio were present, along with the entrepreneurs and startup founders.

2.4.5 Results

Health tourism definition

Traditionally, in Italy, health tourism or medical tourism refers to some people's habit to visit foreign countries or regions to gain access to cheaper or more advanced medical treatments. This is the case, for example, for people living in the South of Italy, who usually move to the North for specific medical treatments.

In the HEALPS project, instead, the concept is widened to comprise also those who seek treatments for chronic disease or continuous assistance during short periods of time, such as in vacation, as well as healthy people escaping from the city routine. These different kinds of visitors would require different kind of services that must be built on top of the existent assets that characterize the alpine space. Based on their different needs, two types of tourists are identified:

- The non-healthy chronic patient
- The healthy tourist seeking for a wellness program

The non-healthy chronic patient - The family caregiver

The home assistance for the non-healthy chronic patient is most of the time handled by a family member that actively acts as a caregiver. This important role has to be considered when designing services for the health tourism: along with the patient necessities to maintain high quality of the assistance, there's also the necessity to reassure the family about the patient's wellbeing.

This attention to the necessities of the family must, therefore, become a central aspect in the design of the services and structures that will be used for the health tourism. The good practice from an Echo-hotel in Milan is presented: in this structure patients and families from a nearby hospital are usually staying for the time needed for the therapy to be completed. Part of the hotel personnel has been trained as ambassador, so that family caregivers can exploit the time of the stay to talk about the challenges they are facing and all the psychological stress they are undertaking. This additional service has created a positive retention effect which is bringing more people in the hotel while offering a much-needed support for the families.

The healthy tourist seeking for a wellness program

The necessity of creating services for those how seek for wellness programs and relaxation is an important step that must be taken in the context of the ever-aging European population. With the raise of the mean age, in fact, extensive efforts must be spent in preventing common diseases and pathologies. In this sense, the promotion of health-oriented vacations could help to achieve a more sustainable and effective form of medical assistance.

Clinical and social aspects of the health tourism – Communication

There are clinical evidences that testify the importance of light sport activity and good eating habits in the prevention of serious disease. Lately, these proven scientific evidences have been applied to the clinics: there are positive examples of Territorial agencies for the Health (ATS in Italy) which organize walking groups and sessions twice a week. During these walks, attention is also payed to the cognitive engagement of the participants, which are usually challenged with tasks and requests in order to facilitate the maintaining of cognitive capabilities.

This is a good example of the multi-modal approach that should always be followed when designing and creating services linked to health.

While the positive clinical effects of health tourism are easy to understand, from a social point of view, the focus group identified a critical aspect: people don't

want to be considered patients. While tourists would immediately appreciate relax and health-oriented programs, they won't like this programs to be identified as health tourism. The Focus group agrees that a better definition would be, in this case, Wellness tourism or Experiential tourism.

Regardless of the social implications of being healthy or being a patient, it would be more beneficial for this health-based tourism to be associated with wellness, relaxation and, more in general, something that could contribute to the psycho-physical wellness of a person.

Particular attention should also be spent in finding cross-targets: sometimes, those who are interested in wellness/healthy programs and lifestyles in contact with nature, are also very sensible regarding themes such as animal brutality, cruelty free food and products and so on. In the Focus Group the example of the Animal Breakfast has been presented: the initiative, where cruelty-free products were used for breakfast, attracted many people with attention to good diet, sport and wellness in general. The advertisement and the dissemination of the health tourism initiative should be able to reach as many people as possible exploiting cross-targeting.

The dissemination of the nature-based health tourism should follow some specific goals:

- Hospital and clinics should be active in publishing and disseminating the positive effects that a healthy tourism would help in achieving. Trying to facilitate the development of healthy habits and lifestyles should be a central focus for clinicians too.
- Trying to let people understand that vacation can be an opportunity to increase people's wellness through healthy diet and sporty lifestyles.
- The health/wellness-related activities must be engaging and enjoyable
- Creating a net of ambassadors that would testify and promote the best practices of a specific region.
- Operators must know about the assets and opportunities offered by the local territory.

How to foster the development of health-oriented services in small communities

Traditionally, the communities that characterize the alpine space are medium-small, with scares economic power or relevance. In the North of Lombardy, for example, most of the tourist's accommodation facilities are, nowadays, small hotels and Bed and Breakfasts. While in some part of Lombardy we have seen an

increase in the luxury hotels, the mid to budget solutions are decreasing in number. This is mainly due to the increase in other types of small accommodations.

There's, therefore, the necessity, to reduce the loss of hotel and other structures, which must diversify their offering from the rest of the tourists' accommodations proposed. A solution for this would come from health- oriented services which can attract specific targets. In the Focus Group the case of old big Summercamp structures is presented. These big colony-like structures are, most of the time, abandoned: with specific restoration and renewal programmes, these structures could become health-oriented accommodations for tourists.

The challenges that must be overcome for small accommodation to become attractive for health tourism are twofold:

Most of the time, it would be impossible for them to hire clinicians and medical staff: there's the need to train professional medical staff that would provide adequate medical services.

Often, there are significant architectural and cultural obstructions that need to be rectified before being able to accept health tourists. Sometimes the structures are also too far away from emergency rooms and intensive care units.

A possible solution:

In order to facilitate the changes that are needed to update the sociosanitary system, a recent reform in the sociosanitary system has created the PREST (territorial socio-sanitary health centers). This health centers are intermediate structures that stand in between patients and hospital in which the patient and his family are taken care of.

These structures could be used to identify the potential services and to connect the end users with the service providers. The identification of the already existent territorial excellences would be the first aim in order to build from such assets.

Along with this task, the PREST could also be in charge of the touristic operators' formation. This formation should be oriented toward the opportunities offered by the health tourism, as well as on the dissemination and communication of such assets. Tourist operators should also be informed about how to create functional services to answer to the necessities of the different end-users that might be interested in the destination.

Use of technologies to improve the services linked with the health tourism

In those areas with difficult viability, complex territorial characteristics and geographical challenges technology could help in providing simple solution to facilitate communication and, therefore, improve safety. Telemedicine services

would, in fact, be extremely useful to keep patients and tourist safe and connected to clinicians.

The Lombardy region is trying to move toward a more sustainable model of sanitary services, centered on the general doctor and personalized medicine in order to reduce hospitalization also through the use of technologies and telemedicine. Some experimental case studies are under development, for example in Pavia, where a bracelet for long term pressure measurement is under testing.

Along with telemedicine, there are other technologies that could be used to promote, improve and foster health tourism. The use of virtual reality, for example, can be a solution to present possible destination to tourists, which can have a taste of the services and the assets that they will find once at the destination. Moreover, virtual reality could be used along with spa and wellness programmes to create an immersive relax experience. Similarly, virtual reality technologies could be used to foster physical and cognitive activities and exercise even when the weather won't allow open air activities.

The use of technologies and digitalization is a very complex filed, which will require intensive studies of usability and compliance with regulations. In fact, there are many devices which can record biometrical data but most of them don't have the CE marking and can only be part of experimental campaigns, far from the market and its end users. Most of the fitness related devices, moreover, don't interact with each other, losing the possibility to create an organic ecosystem of devices.

Along with a lack of regulations, there's scares awareness of the potential benefits linked with the use of these technologies: due to this lack of information and clear proves of efficacy, there is still a great inertia from the tourist accommodation facilities to accept these technologies. There are multiple problems linked with the necessity of learning how to use the devices, as well as the time needed to prepare, operate and control these devices.

Goal

There's the need of a systemic change in the strategies linked with technology update of the existing services on a Regional level, which must, then be extended to the municipalities. Regions must have a central role in the training and in the creation of a sound and organic vision regarding technological devices.

Conclusions

Classic tourism substantially differs from the new paradigms of tourism and health tourism. Today the tourist has more experience and multiple needs towards his/her stay in vacation. Tourists now search for specific products and services, tailored around their necessities, among which health plays a fundamental role.

The new holistic touristic offer should be therefore ready to satisfy the multiple necessities of the tourist, creating a multidisciplinary wellness service comprising alimentation, sport, cognitive and physical rehabilitation as well as therapies when needed.

In order to reach this goal, a strong cooperation between Regions, local authorities, municipalities and service providers must be achieved.

2.5 FIRST PILOT STUDY IN TAVECCHIA

A First pilot study was organized, as previously proposed, in order to gather information regarding tourism in the mountains, digitalization and health. For the pilot study, that was held at a chalet at Tavecchia (Introbio, Lecco, Lombardy), questionnaires were prepared. The questionnaires tool was selected as the best possibility to collected relevant data directly from the end users that were on vacation in the mountain; in order to be efficient and collect as much relevant data as possible, the questionnaire had to be short and easy to fill.

The questionnaire, (see attachment), focused on establishing the level of confidence of those who participated at the pilot study with the tourism in the mountains. At first, people were asked to specify how many times per year they were going in vacation in the mountains, for how long and if the destination was mostly the same or if they were used to change destination often.

Those who participated were also asked which were the reasons they were considering valid to choose a specific destination compared with others. The questionnaires also tried to establish which were the three best activities they would consider during a period in the mountains and which aspects they considered to be the most critical when choosing a vacation in the mountains.

The questionnaires then focused on establishing travelers and hikers' relation with digital devices, in order to understand which technologies, they were considering to be the most useful and they were used to wear and use in their vacations.

Finally, the questionnaires also tried to asses people's health conditions, asking for chronic, recurrent or transitional pathologies.

138 questionnaires were collected, among which 7 were discarded due to being uncompleted or unreadable, leading to a total of 131 questionnaires analyzed in the following report.

2.5.1 Demographic data

Age

5 age ranges were defined for the project, ranging from 18-30 to 60+. The most represented range goes from 41 to 50 years old, totaling the 26.7%, followed by the 31-40 range and 18-30. Only the 6.9% of the interviewed was 60+. The following table shows that the sampled has roughly the same representation for each of the ranges defined except for the 60+ range.

Frequency		Percentage	Valid Percentage
18-30 years	30	22,9	22,9
31-40 years	31	23,7	23,7
41-50 years	35	26,7	26,7
51-60 years	26	19,8	19,8
60+	9	6,9	6,9
Total	131	100,0	100,0

Sex

In the same way, the sample is also well balanced in terms of males (50.4%) and females (48.8%). For one questionnaire it was impossible to define the interviewed sex.

Schooling

Two persons didn't answer the question. Most of the interviewed have a high school diploma, followed by master and bachelor's degrees, as per the following table

Frequency			Percentage	Valid Percentage
Valid	Middle school	18	13,7	14,0
	High school	62	47,3	48,1
	Bachelor's degree	19	14,5	14,7
	Master degree	20	15,3	15,5
	PhD, master	10	7,6	7,8
	Total	129	98,5	100,0
Missing		2	1,5	

The sample is quite representative of the Region level of schooling, with a slightly higher sample size for the highest levels of schooling.

Habits

Frequency of vacations and visits in the mountains

The 29% of the participants states that he/she visits the mountains roughly one or two times per month, the 23.7% of them states that he/she visits the mountains less

than 6/7 times per year. Those who visit the mountain each weekend are the 19.8% while smaller percentage of the interviewed visit the mountains only during the summer (4.6%) and winter (6.9%) vacation.

Frequency		Valid percentage
Each weekend	26	19,8
Once or twice each month	38	29,0
Less than once per month	31	23,7
During summer holiday only	6	4,6
During winter holiday only	9	6,9
Other	21	16,0
Total	131	100,0

Among those who answered "Other", most of them choose Occasionally (61.9%), comprising "3-4 times per year", "seldom", "rarely".

Frequency			Valid percentage
Other	No answer	6	28,6
	Twice a week	1	4,8
	In the summer	1	4,8
	Occasionally	13	61,9
	Total	21	100,0

Destination

The vast majority of the sample (79.2%) changes destination very often, rarely going to the same place twice.

Frequency			Percentage	Valid percentage
Valid	Same destination	25	19,1	19,2
	Almost always in a new destination	103	78,6	79,2
	Both	2	1,5	1,5
	Total	130	99,2	100,0
Missing		1	.8	

For the 19.1% percent of people that use to return to the same destination, the reason has to be found in the feasibility of reaching the destination: 26.8% of people prefer a destination which is close to home, 18.8% of the total sample prefer destinations which could be reached with personal car. The 16.1% of the total sample size choose a certain destination based on the positive effect this decision would make on their own health.

Reason for choosing a specific destination	Frequenza	Percentuale	Percentuale valida
Easy to reach with personal car	21	18,8	18,8
Easy to reach with public transportation	4	3,6	3,6
It's close to where I live	30	26,8	26,8
The destination has positive effects on my health	18	16,1	16,1
It's a unique place	7	6,3	6,3
I find services that can't be found anywhere else	10	8,9	8,9
It's cheap	7	6,3	6,3
Other	15	13,4	13,4

Length of the stay

The majority of the sample stays in the mountains for one weekend, between two and three days. Within the 26.2% of "Other", the vast majority of the sample has chosen "Daily trips".

Activities

We asked the participants about the three activities they prefer doing while spending a vacation in the mountains. From a previous classification defined on a semantic base we identified the following macro-areas:

- Walking, Hiking
- Winter sports: comprising skiing, snowboarding and sledging.
- Running: comprising also trial running
- Having lunch / Dinners
- Alpinism, Climbing
- Relaxing
- Thermal and spa treatments
- Shooting photos

The following table shows the most recurring answers that were collected:

Frequency		Percentage
	1	,8
Trekking	95	72,5
I work in the mountains	1	,8
snowshoeing	4	3,1
Growing vegetables	1	,8
Running	1	,8
Having lunch / Dinner	6	4,6
Eating together	2	1,5
Eating local food	2	1,5
Mountain Bike	1	,8

As its clear from the table, t favorite activities during stay for winter sports, while most with friends and family.

Going for walks and Hiking as (11.5%) visits the mountains ng lunch and typical products

These results are confirmed by the "second choice-activity" in which hiking, winter sports and eating activities have a more uniform distribution (ranging from 17.6%, 15.3% and 18.4%).

Most of the sample didn't answer for the third option activity.

Summer Activities: comprising hiking, trekking, walking, mountain bike, running, trial running

Winter Activities: comprising winter sports and snowshoeing

Having Lunch and Dinner: comprises all the activities linked to eating and drinking typical food

Spending time with other people: comprises eating with other people and all the leisure activities that involve a group of people

The mountain aspects that are appreciated the most:

Eight categories were defined to group the possible aspects that people could appreciate about visiting the mountains:

- Relax and peacefulness: comprising peace, silence, relax, loneliness
- Escape from daily life: comprising getting away from the city, not having fixed hours, getting away from chaos, following simpler life habits, leisure activities
- Naturalistic aspect: comprising the possibility of staying in touch with the nature, sights, panoramas, clean air, absence of pollution, staying out, sunsets, bird and animal watching.
- Destination specific aspects: the place, other people's friendliness, comfort, traditions
- Physical activities: trekking, going for walks, skiing etc.
- Social aspects: staying with the others, staying with friends, spending time with people, meeting new people, friendliness
- Health benefits: improved mood, fulfillment, general wellbeing, sense of freedom, calm, peace, relax
- Food and typical products: food, eating, drinking, trying genuine products

Among the collected answers, 103 people prefer the Naturalistic aspects of mountain life: the contact with nature (65 preferences), the wide spaces and the non-polluted air (22), being able to see animals (3) and other naturalistic aspects such as sunsets and the everchanging landscapes.

53 preferences went to the Relax and peacefulness aspects that are linked with the alpine and mountain region. Among the answers, the most recurring were the sense of calm and relax (35) and silence (14).

26 and 25 people preferred physical activity and the social aspect respectively while 17 people are attracted to the mountain by the possibility of eating typical foods.

Only 11 people referred to choose the mountain over other destination for the beneficial effects over their health and general wellness.

Aspects that need improvement

49 people didn't answer the question, while 25 stated that nothing needs to be improved or changed regarding their mountain vacations.

Among those who answered, the most frequent indications focus on improving the accessibility (improving car parking, reducing car traffic) and improving the quality of trials, which sometimes see the presence of trash. Some of the interviewed also ask for reduced costs.

6 people would like to change aspects that are not dependent with policymakers or the other actors: they would like to have more money and more free time to enjoy the mountains more.

5 people asked for additional information regarding the destination, especially in order to have more trials while 5 other people ask for more information about the chalets and the activities they promote.

5 people would like group activities to be organized in order to attract more people, especially children, maybe creating special packets of services tailored to the different needs for elders or children.

4 people would like services in the chalets to be improved: they would like to have more chalets with more basic comforts such as hot water or comfortable beds. On the other hand, 2 people would like to have the least human contamination possible, with the least amount of people, cars and infrastructures to ruin the mountain landscape.

Only 2 people indicated a need for technologies to improve the mountain experience: they would like to have, for example, an application that would keep track of activities in a certain place, in order to increase his engagement with the social aspects of the mountain destination.

1 of the interviewed reported the necessity of creating more aggregative activity, reporting the French experience of les conintamines, which are weekly happenings organized by the local associations in order to get people together.

Technology and digitalization

When directly asked about if and how technology was a part of their habits in the mountain, most of the sample answered that they don't use technology (54.2%). Among those who use it, most of them (25.2%) use simple tracking apps for smartphones, while only the 15% of the sample use wearable devices or apps.

Frequency		Percentage	Valid Percentage
Wearable devices	11	8,4	8,5
Application for smartphones	33	25,2	25,6
I use something that it's not a wearable device nor an application	4	3,1	3,1
I don't use any technology	71	54,2	55,0
Both wearable devices and apps	10	7,6	7,8
Total	129	98,5	100,0

The analysis of which technological devices the sample uses gave the following results:

- 5 people use a Garmin device
- people use Samsung's devices

The devices are mostly used to track the heart rate and the number of steps as well as to take pictures and to navigate using the GPS.

Among the most used Apps, the localization and GPS apps are represented the most (google maps, peaklens).

Psychophysical conditions and diseases:

74 people are healthy, 24 people don't answer the question and 30 have some sort of psychophysical pathology.

Frequency		Percentage
No answer	27	20,6
Healthy	74	56,5
Non-healthy	30	22,9
Total	131	100,0

Among those who are non-healthy, the diseases are divide between chronic, recurring and transitory as per the following table:

	Frequency	Percentage	Valid Percentage
Chronic	15	11,5	50,0
Recurring	10	7,6	33,3
Transitory	5	3,8	16,7
Total	30	22,9	100,0

The pathologies identified are mostly respiratory, postural and articulatory. Along with these pathologies, some people of the sample are suffering from hypertension or hypotension as well as cardiac pathologies. Similarly, people reported osteoporosis, hypothyroidism, digestive diseases, anemia, diabetes and headaches.

Services proposed

98 people don't answer the question. 19 people answer that no changes are needed while two people don't know how to improve the already existent services.

Among those who propose new services, most of the interviewed ask for safety kits to be placed along the trials: the kits could comprise defibrillators and anti-anaphylactic drugs.

Two people proposed the possibility of lending GPS trackers to hikers while some are asking for free botanic and trial manuals to be give to tourists.

Again, the necessity of creating services for children is underlined.

2.5.2 Conclusion

In conclusion, the sample that was interviewed and analyzed in this first pilot study comprised people in the range from 18 to 50, mostly with an high school diploma which visit the mountains at least once a month for a brief time (generally for the weekend).

These visitors prefer to do sport activities, both in the winter and during the summer, and loves to spend time with the others while eating and drinking. As expected from the chosen destination, the activity they prefer the most is hiking and going for walks while only a small sample focus on wellness oriented activities only (20%).

From this initial analysis, we can also infer that the naturalistic aspects of a vacation in the mountain (such as the beauty of the landscape, being in close contact with nature, the quality of life in general) and the necessity of relaxation (resting, enjoying the silence, loneliness, being able to get away from the chaos of the cities) are the

most appreciated characteristics that visitors look for. The main reasons for the interviewed sample to reach the mountain can be found, therefore, in these aspects.

The critical aspects that this sample has identified focus mainly on the viability and accessibility to the chalet and trials, along with the cleanness of the landscape. The interviewed would also like the mountain chalet to be more proactive towards children and young people in general, in order to create services that would help in attracting younger people. At the same time, a need for services oriented towards the elderly was underlined.

Regarding the use on technological assistance during the mountain stays, the sample identified that the vast majority of the interviewed tend to use only their smartphone, along with simple apps to track position and the number of steps. Anyway, most of the interviewed stated that he/she doesn't feel the need of using technologies.

Final Remarks

The pilot study was useful to identify some of the needs that users might have when visiting the alpine region. The results showed how much people are attracted by the quality of the landscapes, the trials, and the conservation of the naturalistic aspects rather than looking for specific services. The need of advanced services increases for the fragile users, such as the elders: in this case, there's also an attention to the services offered by mountain chalet.

In conclusion, the questionnaires showed how the alpine region has a natural attractiveness, due to its geographic characteristics, which can be improved by providing specific services for fragile people. Regarding the use of technology, there's still a great room for improvement in the capillarity of its diffusion: sometimes the capabilities of technological devices as well as simple apps for the smartphones are underestimated. Work can be done in improving the way these technological assets are seen and used.

2.6 SECOND PILOT STUDY IN FUIPIANO

This study wants to evaluate if using technological and wearable tools, and the kind of feedback theese tools provide to the user, affect user experience in terms of motivation, engagement and flow.

Several researches (for instance: Yang et al., 2013).based on Deci and Ryan's theoretical model (1985) suggest that positive or negative attitude towards the use of a specific device depends on two complementary factors that act during the interaction with the tool: the utilitaristic evaluation (in other words, the usability of the device), and the assessment of the emotions created during the interaction.

We hypothesized that estrinsic motivation is influenced by devices' performance, with particulary focus on device's ease of use and usefulness, as Davis suggested in his Technological Acceptance Model (Davis, 1989) and its following edits (Venkatesh e Bala, 2008).

We wanted also to assess intrinsic motivation in order to see if it was affected by technology. For this reason, we considered emotional positive and negative aspects related to the experience (Kercher, 1992), the positive ones related to the use of the wereable tools (Thompson et al.,1991), and the experienced flow (Rheinberg, 2008; Csikszentmihalyi & Rathunde, 1993).

2.6.1 Study Design

Sample N=10

Two groups: A and B

Group A

- Walking without technological device from the beginning to the middle of the path
- Questionnaires during the pause
- Continuation of the journey with the technological tool
- Questionnaires

Group B

- Walking with technological device from the beginning to the middle of the path
- Questionnaires during the pause

- Continuation of the journey without the technological tool
- Questionnaires

Questionnaires

Before the walk: attitude toward new technologies (Groups A and B): adaptation Venkatesh et al. (2003)

During the pause:

- Perceived usefulness of the tool (group B): adaptation from Porter e Donthu (2006)
- Perceived ease of use of the tool (group B): adaptation from Venkatesh e Bala (2008)
- Emotional aspects (group A and B): adaptation of PANAS Short Form (Kercher, 1992);
- Emotions related to utilization (group B): adaptation of Thompson's Affect Scale (Thompson et al. 1991)
- Flow (group A and B): fromJackson and colleagues (2008)

At the end:

- Perceived usefulness of the tool (group A): adaptation from Porter e Donthu (2006)
- Perceived ease of use of the tool (group A): adaptation from Venkatesh e Bala (2008)
- Emotional aspects (group A and B): adaptation of PANAS Short Form (Kercher, 1992);
- Emotions related to utilization (group A): adaptation of Thompson's Affect Scale (Thompson et al. 1991)
- Flow (group A and B): fromJackson and colleagues (2008)
- Open questions about what kind of feedback given by the tool is more interesting or annoying

Technological devices

- Chest band Polar H7
- Smart watch Fitbit Charger 2

- Smart watch Mi Smart Band 3
- Smart watch fēnix® 5 Plus Sapphire Titanium
- Heart Rate Sensor Polar OH1

2.6.2 Statistical Analysis

Descriptive and frequency analysis are conducted for all quantitative variables (namely: "attitude towards technology", "perceived ease of use", "perceived usefulness", "positive affects", "negative affects", "emotions related to interaction" and "flow").

T-test for independent samples are conducted to evaluate if perceived ease of use (PEOU) and perceived usefulness (PU) are affected by exposure order (group A or B), using "group" as grouping variable, or by the type of the tool, using "device" as grouping variable. The same analysis is repeated with "emotions related to the interaction" as dependent variable, as well as with all the other variables.

T-test for paired samples are conducted between "flow with device" and "flow without device" in order to evaluate differences due to the use of the tool; the same process is done with "positive affects" and "negative affects".

Moreover, it is evaluated if "perceived ease of use" and "perceived usefulness" affect the emotions related to the interaction running a linear regression and using the first two variables as independent variables and the other variable as dependent variable. The same analysis is run using "flow with device", "positive affects with device" and "negative affective with device" as dependent variables in order to see the influence of usability (PEOU and PU) on these factors.

2.6.3 Results

The sample consists in ten subjects, 5 of group A and 5 of group B.

The variable "attitude towards new technologies" achieved the maximum of the scores for all subjects. This variable will not be taken into consideration in subsequent analyzes for this reason.

Usability

The average score of "perceived ease of use" variable was 3.73±0.85, on a scale from 1 to 5. Most of the people reported a score of 3.5 (N=3, 20%).

On the other hand, the average score of "perceived usefulness" variable was 3.87±0.71 (always on a scale from 1 to 5). Half of the sample (N=5) reported a score of 3.67.

The two variables were assessed considering the different devices used. No statistical difference appeared depending on the tool, but graphically there is a trend that could be seen in the following table.

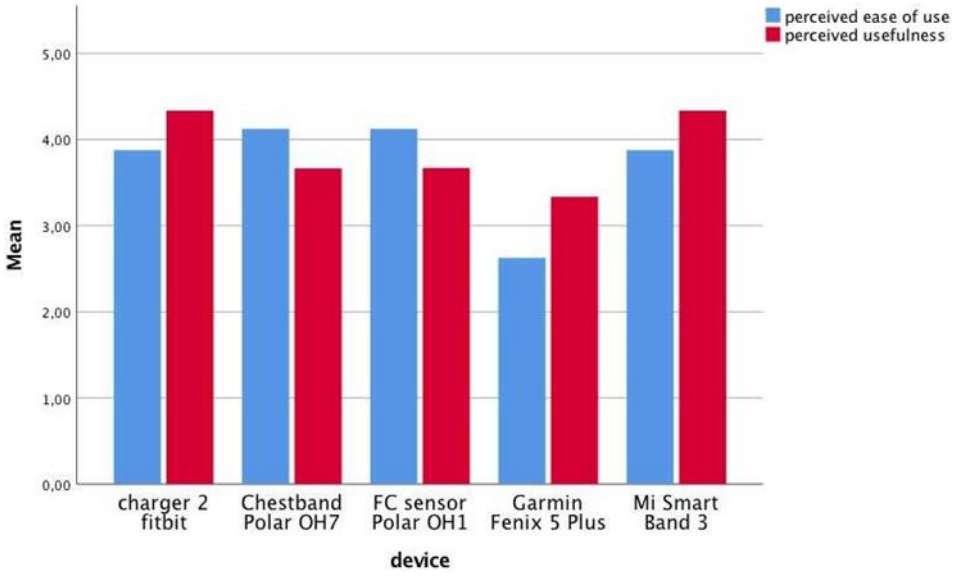


Figure 2: Mean of PEOU and PU for different devices

The sample referred as the simplest device to use the two heart rate sensors, while the device that receives the least score was the Garmin Fenix 5 Plus device.

Fitbit and Mi Band received higher scores in “perceived usefulness”, Garmin obtained the most negative feedback.

The two variables were evaluated considering the difference between groups A and B. No statistically significant difference appeared due to the group to which subjects belonged, but a tendency to report higher scores in group A emerged (namely in subjects who did not used a device in the first step) (see tab.3). Group A reported an average score of 4.07 ± 0.89 in "perceived utility" (3.67 ± 0.47 group B), while it reported 4.05

± 0.65 in "perceived ease of use" (3.4 ± 0.98 group B).

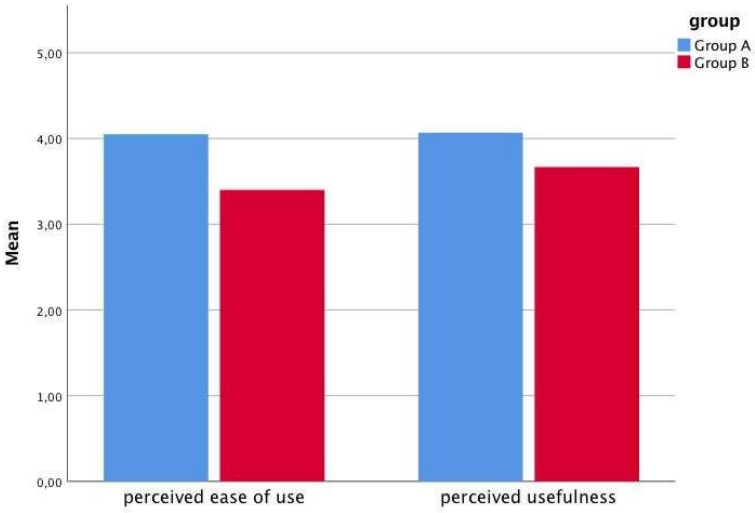


Figure 3. PEOU and PU in the two groups

Emotional aspect

With respect to the variable "Emotions related to interaction ", the sample reported an average score of 3.9 ±

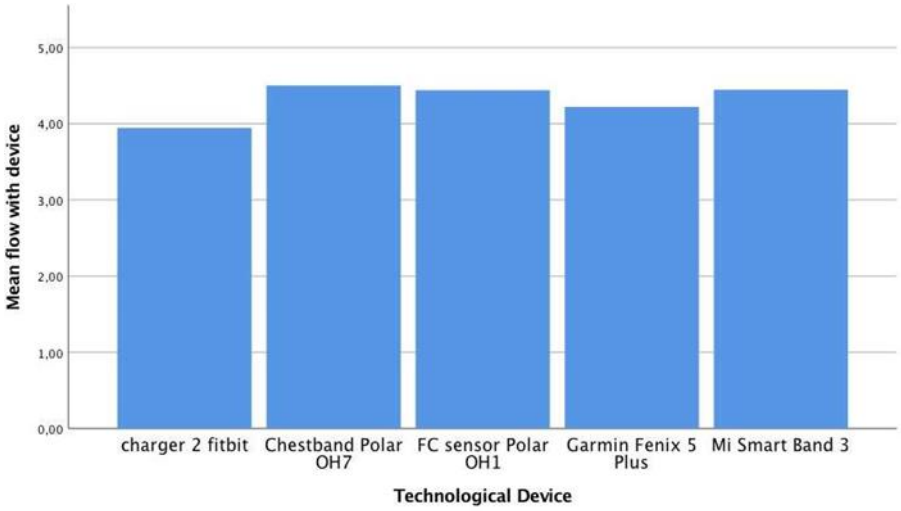
0.63 (on a scale from 1 to 5). No significant difference in the scores due to the use of a particular device emerged.

Comparing group A and group B, group A reported higher scores, with M = 4.2 ± 0.38 (M = 3.6 ± 0.72 in group B) but the difference was not statistically significant.

The results of the linear regression statistical analysis indicated that the emotion related to device's use was influenced by the perceived ease of use ($F1.8 = 10.48$, $p < 0.05$) but not by perceived usefulness.

The average score of the "Flow" variable reported was 4.38 ± 0.57 in the experimental condition without technological devices, and 4.31 ± 0.68 in the other condition. T-test did not report a significant difference.

The flow reported both with and without the device was not influenced by the exposure order to the device (groups A or B) and did not depend on the device used (tab.5). Moreover, the flow experienced during the use of the device was not influenced by the usability of the instrument, as reported by the simple linear regression analysis.



Analyzing positive emotions scores, the average reported without technological device was 3.76 ± 0.84, while it was 3.82 ± 0.78 when using a device; the difference between the two scores was not significant. Furthermore, the scores did not depend on the group subjects belonged to or on the device used. Finally, the positive emotions reported in the experience with the device were not influenced by the usability of the instrument.

The average score of negative emotions reported without using a technological device was 1.52 ± 0.94, while it was 1.72 ± 0.84 in the other condition; the difference was not statistically significant and no difference due to belonging to group A or B was found, as well as to the use of one device instead of another. Furthermore, the negative emotions reported in the experience with the device were not influenced by the usability of the instrument.

Open questions

The results showed that all the positive aspects reported were not related to the use of technologies. In particular, 10 answers (of 25) were related to being in a open space (clean air, landscape) and 9 on the social aspect (being in company, meeting new people). 5 answers were related to physical activity and one was related to the happiness in doing something different than usual.

Similarly, the negative aspects reported were not related to technologies, except for a person who replied "I did not know how to use the device"; this response was reported by a subject who used the Garmin Fenix 5. The rest of the answers were related to slope and physical problems (N = 10), and to climatic conditions (N = 2).

The subjects were asked which feedbacks received from the devices were more appreciated or useful. 4 subjects reported that they did not receive timely info, or that they did not consult the tool. Among those who interacted and obtained information, 5 appreciated the information on heart rate, and 2 on calories spent. No useless or annoying information has been reported by subjects.

2.6.4 Conclusion

It emerges that people, all positively predisposed to use new technologies in the walking experience, perceive devices as more useful rather than simpler to use, with the exception of devices that do not give timely feedback (such as heart rate sensors) and therefore these tools are perceived as less useful even if simpler. The Garmin Fenix device is perceived as too complex to use and this does not allow the subjects to receive the information they want.

The tool's usability does not depend on the order of exposure to the experimental condition (group A or B), even if there is a tendency to better evaluate the device if it is used in the second phase. It is possible that the discussion between subjects during the first phase has reduced the expectations of those who tried the technologies in the second phase, or that having performed the walk at first without any feedback made the device more appreciated afterwards.

The emotional aspect related to the use of a technological device does not differ according to the device tried, and they are not influenced by the order of exposure to the tool. The tendency to report higher scores in the group A remains, probably because the same subjects have also a higher devices' usability In fact it emerges that the emotion linked to the use of the device is influenced by the perceived ease of use: the simpler a device is to use, the more positive the emotions are.

Regarding the flow and the positive and negative emotions, no difference emerges between the experience with and without technological instruments, and these variables are not influenced by devices' usability or by the order of exposure to the condition (group A or B).

In our sample no suggestion that using new wearable technologies improves the intrinsic motivation, in terms of flow and positive emotions, is present. It emerges that it could be possible to work on extrinsic motivation by improving the usability of the devices in order to enhance affects strictly related to using a specific technological tool.

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