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Master’s Thesis
Academic Year 2016

Run With Me: Real-Time Active Sports Storytelling

Keio University Graduate School of Media Design

Albara M. Alohalı
A Master’s Thesis
submitted to Keio University Graduate School of Media Design
in partial fulfillment of the requirements for the degree of
MASTER of Media Design

Albara M. Alohali

Thesis Committee:

Associate Professor Kai Kunze (Supervisor)
Professor Keiko Okawa (Co-supervisor)
Professor Hiro Kishi (Member)
Abstract of Master’s Thesis of Academic Year 2016

Run With Me: Real-Time Active Sports Storytelling

Category: Design

Summary

This Thesis explores storytelling tools for runners. We believe that sharing third person 360-degree live-streams and stories while running can be a motivational factor to get people engaged and more active. To this end, we conducted a couple of initial user tests, exploring if live-streaming runs on popular streaming sites can be engaging for the audience. To make the streams more immerse, we experiment with 360-degree and third person view. We present and evaluate an initial hardware setup for 360-degree video streaming run stories.

Keywords:
Experience Sharing, Storytelling, Sports, Running, Immersion

Keio University, Graduate School of Media Design
Albara M. Alohali
Acknowledgements

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Albara M. Alohali
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Chapter 1
Introduction

Many people find it hard to get out from their comfort zones, up from their bed, or off their couch to go out for a refreshing sports activity such as running. And many of those occasion runners find it difficult to incorporate such activities into a habit. This thesis explores new ways to utilize existing tools to tell and experience stories differently in the context of performing sports, primarily running. Targeted towards storytellers who would like to become fit and active, exploring new places, acquiring new information, while telling compelling stories for themselves to keep or share them with friends and family and inspire the world.

1.1 Storytelling

Since the dawn of human existence, storytelling has been and remains a significant connection to our humanity. It is what links us to our past, and provides a glimpse into our future. Since humans first walked the earth, they have told stories, before even the written word or oral language. Through cave drawings and over fires, humans have told stories as a way to shape our existence. Things happen to us – the elements of a story – but as humans, we have unique perspectives, which shape how a story is delivered. We seem to be hooked by stories with characters that look like us – or at least share characteristics we can relate to. We also desire to be drawn into the storytelling and enjoy when a story builds up to a thrilling climax, followed by a satisfying conclusion. We want to use our imaginations, and sometimes don’t, and prefer to have passively a story told to us. Storytelling is how we make meaning out of the chaos of human existence. It provides a shape, so that our lives have a beginning, middle, and an end, and we can feel like we’ve meant something, and left our mark on the world. If just one person can tell just one bit of our life story, then we have a narrative, and we are the heroes in our life story. This is why we create stories, and this is why we need storytellers.
1.2 Background

According to the author of this thesis, the act of running was gradually converted into a habit for mainly two reasons, the first due to him LOGGING: as he was monitoring each of his running activities using a smart-phone application namely Nike+ Running (Figure 1.1). Tracking the progress going from slow and short distances into faster and longer ones while seeing the growth and improvement gradually happening was one major reason which helped him become motivated to keep on the habit and remain in a continuous Improvement state. A second reason was due to STORYTELLING: which started with simple picture after each run denoting the distance, taken path with a lower angle shot showing the runners leg and shoes and a scene from the location of the run (Figure 1.2). Thus, with every run, he goes out logging his performance, he would try taking a different path or explore a different neighborhood, and with a constant drive that resulted in telling a story with each run in that single shared picture. That created a social accountability upon posting them after each run to Instagram and Facebook and having feedback on that. Besides, the collection of these pictures felt like a trophy for each activity that motivated him to keep running and exploring more, which
in an indirect way led running into becoming a habit of his.

The next iteration of running storytelling was when he migrated to a more advanced Running Tracking application called Strava. Which provides more detailed logging to the performer as well as allowing to add multiple pictures for each run to serve as a story, in addition to the integration with other data visualization services such as Gyroscope, which can translate these activities into interesting infographics. (Figures 1.3 & 1.4)

Along with that came another application that he utilized for running storytelling, namely Snapchat, a mobile application that allows users to send and receive "self-destructing" photos and videos. Which he used for daily engaging life-logging. While running was a major part of his daily story, he posed the challenge of, how can he tell an engaging story out of activities that repeat itself of daily bases?
1.2 Background

Figure 1.3: A visualized run via Gyroscope

Ran 42.3 km!
That’s equivalent to...

18 DONUTS
3,076 calories

TOKYO
54,785 STEPS

Figure 1.4: A visualized run via Gyroscope

Ran 42.3 km!
That’s equivalent to...

27 COOKIES
3,076 calories

TOKYO
54,985 STEPS
1.3 Motivation

Many people find it hard to get out of their comfort zones, up from their bed, or off their couch to go out for a refreshing sports activity such as running. Moreover, many of those occasional runners find it difficult to incorporate such activities into a regular daily habit. Moreover, with the increasing urban growth and the city lifestyle that discourages having such an active routine have contributed to a significant increase in many desires such as Diabetes. Where during only the past thirty-four years the number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014\(^1\). Making it the fastest growing disease in the world and projected that no other disease would outpace its growth over the next two decades\(^2\). Here where storytelling can come in handy as an effective tool to engage and motivate people into becoming more active beings. To lead people into doing something they have never done before, they have to imagine how this new world could look like, and through engaging active storytelling, people can be touched emotionally, so that they see and believe with generative minds.

This is a tool to help people engage and enjoy such an activity while learning something new and exploring new places with each run while telling compelling stories for others to enjoy or for them selves to remember.

1.4 Objectives

This research aims to design an experience utilizing existing tools and services and combining them into a single system where runners and active performers can conveniently engage in their activities while telling compelling stories that can be entertainingly consumed in real time by their audience. Creating such an experience could consequently have multiple results based on the users role in the experience whether they are on the active performers side (HEROES), or they are on the active audiences (SIDEKICKS) side. Such objectives and results can be listed as follow:

---


1. To help new active performers (HEROES) to transform their casual running habit into a regular one.

2. To encourage both active performers and active audiences (HEROES and SIDEKICKS) in becoming more explore of their scenic and beauty of their cities and neighborhoods through running.

3. Allow the active performers (HEROES) to record a worth keeping and telling stories from their logged activity, which can serve as a useful reflective, exploratory piece of logging.

4. Provide an indirect motivational content for people whom are willing to perform such activities but need a little push to become active, by engaging them with a material that will encourage them to do that activity, and potentially turning the from active audiences (SIDEKICKS) into becoming active performers and storytellers (HEROES).

5. Encouraging active performers (HEROES) to become more aware of their surroundings, explore new places, learn and tell about new facts, the places and activities they are performing, leading them to become better active storytellers.

Inspired by these objectives, this thesis has proposed two hypothesis:

1. Broadcasting a live story of a sports performance (running) increases the motivation for becoming more active. Such applies to both active performers (HEROES) and active audiences (SIDEKICKS).

2. Recording in 3rd Person 360 point of view provides an immersive experience to people watching such a story.

To see whether these hypotheses hold true a set of survey questions have been distributed before and after conducting some test cases of live sports storytelling, which is listed in details in chapter 4. Based on these results we were able to prove that the first hypothesis holds true and that live-immersive-storytelling was indeed motivational and it sparked the desire for the audience to go out and perform a similar activity. This was later supported by some interviews with volunteering users in the experiment measuring their engagement and monitoring their improving performance and feedback. More of the methodology and results is discussed in Chapter 3.
1.5 Contribution

This research proposes a new way for experiencing sports through storytelling and interaction between active sports performers and their audience. The proposed experience design apart from contributing to the sports field creates new opportunities for telling storytelling and logging experiences that can serve multiple benefits for the active performers and the communities surrounding them. The contribution points are as follow:

1. Exploring new ways for logging and telling immersive stories while running or performing active sports, conveniently with minimum distraction to the performers.

2. Finding the optimal setting for wearing a camera or the logging device on sports performers during their activity. Particularly for runners, hikers, or cyclist.

3. Put the effect of peer pressure and social accountability in practice by bringing them into the experience of sports performance as a motivational element. This point was included as a hypothesis and was proven to hold true for the majority of the participant based on the users studies discussed in Chapter 3 and 4 of this paper.

4. Testing different camera angels and point-of-views that provide the best immersive experience to the active audience participating in the story.

As it will be shown in further chapters, this experience design also highlights how effective storytelling when implemented in the sports context, can effect positive behavioral changes such as habit formation or motivation to perform certain sports. Besides, these benefits can extend to other indirect benefits such as encouraging tourism activities which will also have economic benefits alongside the health and fitness benefits on the long-run.

1.6 Thesis Overview

This thesis consists of five chapters. The first chapter serves as a primary platform for this research introducing the background and previous work, and motivation that led to the commencement of this study. The second chapter presents works
that in some way relate to this research highlighting the points where this design research can complement these works. The chapter is separated into two sub-categories. The first is related to projects and applications that have to do with running immersion. While the second is more focused on existing research and projects that tackled the world of live broadcasting with wearable cameras. The third chapter introduces the concept of this research; it is philosophy and vision, deep ethnography conducted for the purpose of in-depth understanding of the undertaken field and target persona, along with a detailed explanation of the user experience designed for the purpose of this study. Followed by the fourth chapter where it presented the series of experiments and test cases performed to arrive at the finally defined user experience. Finally, chapter five offers results of the research with discussion of its limitations as well as possible future works.

1.7 Key Terms

Key terms used in this thesis:

**HEROES:** Is the term used to describe the active performers performing the sports activities whether it is running, cycling or hiking. They are the ones telling the story to the active audience (SIDEKICKS).

**SIDEKICKS:** Is the term used to describe the active audience watching and sometimes participating in the creation of the story. They are called SIDEKICKS for their ability to support the HEROES during their activity.

**FPV:** (First Person View): also known as first-person point of view (POV) is the ability of the user of some technology to see from a particular visual perspective other than one’s actual location, such as the environment of a character in a video game, a drone, or a telemedicine client.\(^3\)

---

Chapter 2
Related Works

As Run With Me is a concept that combines multiple ideas and from different disciplines into one experience, it was important to tackle each of these components separately and see how they relate to this research. Highlighting the aspects that worked well and the points that could be improved and where this experience was able to do covering these cons. This first part is related to projects and applications that have to do with running immersion. While the second is more focused on existing research and projects that tackled the world of live broadcasting with wearable cameras.

2.1 Sports Immersion

This part mentions a selected number of applications that tackled the problem of being immersed in a sport, particularly running.

Zombie Run

Zombies, Run! is an immersive running game co-developed and published in 2012 by Six to Start and Naomi Alderman for iOS and Android platforms. Players act as the main character through a series of missions, during which they run and listen to various audio narrations to uncover the story in the virtual world while running in the real world. The application uses the smartphone’s GPS signal and accelerometer to determine the progression in the game calculating speed, time and distance. Users also can opt-in “interval training” as the player has to run 20% faster at some segments of the run to escape zombies chasing them in the game. ¹
This game provides an entertaining experience utilizing the capabilities existing in smartphones nowadays along with the audible narrative feature where runners don’t have to distract themselves by looking into the screen to be able to engage in this experience. It also gives a feeling of Heroism where the runner is playing the hero role which can provide extra motivation for activity and continuity. However, in such experience, the runner is only consuming stories and not telling them. These stories are already developed and narrated to the player with a limited number of missions. Even though the application has added a new pro feature where players can create their virtual levels, the whole game still plays in the virtual world and lacks the interaction with actual active with the real world surrounding the players.

**StoryRunning**

StoryRunning is a feature introduced by (Rantastic) in their Fitness tracking (Runtastic App). It tries to merge audiobook with workout mixes to provide something to think about or absorb the listener while providing musical stimuli to aid pace. It’s designed for four different contexts: Adventure, Fantasy, Motivation, and Travel. Although you could play a song or an audiobook through the in-app local music player on your phone, most audiobooks and songs are not
best configured for workouts as what you hear affects how you work out. It is scientifically proven \(^2\) (Brodsky 2001) that the speed, or beats per minute (BPM), of the audio that you listen to have a direct impact on the speed at which you run. However, the (StoryRunning) application so far have provided a limited number of stories, which lasts for a very limited time, averaging (37 minutes) per story. And while the only type that might be consider engaging with the external environment, as well as the provided content in the category of (Travel), the others are still separated from reality which provides a similar case to the previously discussed application (Zombie Run).

## 2.2 Wearable Live Telepresence

Video sharing and live-streaming can be a very engaging means of storytelling and helps to form communities, as seen by popular sites e.g. Snapchat, Periscope. However, what we are looking for here is for projects that engage interesting POV for activities while they are happening in real-time without distracting the performers during their activity. This is usually achieved through wearable cameras. However, there is another challenge which is transmitting such feed live. Up to this end, few projects have attempted to do so, most notably and to be discussed are the following.

**Polly**

Telepresence systems usually lack mobility. Here is where project Polly have stepped in. Polly, is a wearable telepresence device, allows users to explore remote locations or experience events remotely through a person who serves as a mobile guide. It consists of a smartphone mounted on a stabilized gimbal that is wearable. The gimbal enables remote control of the viewing angle as well as providing active image stabilization while the guide is walking \(^3\) (Kratz et al. 2014). (Figure 2.2)

An interesting feature that Polly has over other similar projects was allowing the viewing agent to control the movement of the camera remotely choosing their field of view independently from their guide. They have also shown that guides felt physically more comfortable when wearing Polly which provided a more stable versus holding a phone in their hands. However, Polly only focuses on one to
one interaction without considering live broadcasting to the masses in its design. There’s also no mention of using Polly in the sports context where footage can be subjected to vigorous movement during the activity. While using a smartphone on Polly is convenient, would it be as immersive as using a 360-degree view?

**LiveSphere**

Sharing a fully immersive experience in real-time has been one of the ultimate goals of telecommunication. That is what LiveSphere proposed by using a head-worn wearable camera (Figures 2.3) that captures 360-degrees spherical images of the users surrounding environment from a first person POV (Figure 2.5). While mounting wearable cameras on the head can result in shaky footage that makes whoever is watching it dizzy and uncomfortable. LiveSphere implemented a system that performs spherical video stabilization while transmitting it to other users so that they are enabled to view shared video comfortably and also look around at the scene from a different perspective independently from the first-person (Figure 2.4). Such set-up is optimal for passive logging especially for sports athletes where such system is designed taking into consideration the light-white of the wearable gear and its practicality\(^4\) (Kasahara and Rekimoto 2014).
However, the design has not focused on the storytelling aspect of interaction with a mass audience. Another limitation is its first-person restricted perspective since it’s a head mount wearable camera which is mostly for experience sharing; usually without intention for engaging motivational storytelling. While indications are showing that third-person view logging could increase the memorability of events (Biondolillo and Pillemer 2015) and can provide a deeper engagement with the audience.

Notes
1 Zombies, Run! Official Website — https://zombiesrungame.com/presskit/
2 Warren Brodsky (2001) The effects of music tempo on simulated driving performance and vehicular control
3 Krutz, Seen and Kimber, Don and Su, Weiqing and Gordon, Gwen and Severns, Don (2014) Polly: Being There through the Parrot and a Guide
Figure 2.5: It captures 360 degrees images of the users surrounding scene.
Chapter 3
Design Concept

Doing an activity such as running, cycling or hiking should not be a lonely or an isolated act. There are much more potentials to not only log and treasure these activities in a unique storytelling way but also to be able to share it with others in a meaningful way that makes informative, engaging and motivational for them to become likewise active in the long run. This chapter will elaborate more on the philosophy and vision behind Run With Me concept, will explain why such methodology works best with a certain type of activities namely (Walking, Running, and Cycling), and will dive into understanding ethnography of type of users who will be using such a system, and finally defining the user experience by breaking it down into surface planes showing thoroughly the details of such experience design.

3.1 Walking, Running, and Cycling

Selecting these specific active sports for this experience was deliberate for several reasons that these sports have in common. First, they are all considered locomotive sports; that refers to locomotion (in biology) which is defined as "Self-powered motion by which a whole organism changes its location through walking, running, jumping, crawling, swimming or flying.". Such locomotion features give these kinds of sports a better opportunity for being exploratory while offering more room for engaging storytelling. Secondly, these sports are considered easily adaptable or require minimal skill acquisition to perform.

As these three sports have much in common, they also have differences in other aspects which resulted in different outcomes during the design experience use-cases described in Chapter 4. These differences are summarized in the following table. (Table 3.1)
Table 3.1: Major Locomotion Sports Comparison

<table>
<thead>
<tr>
<th>Sports Adoption</th>
<th>Walking</th>
<th>Running</th>
<th>Cycling</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Is a basic human ability that almost everyone can perform unless prevented by a handicap or a limiting physical environment. It also requires minimal gear.</td>
<td>As basic as walking, it requires an extra effort and endurance yet still can be performed by most people unless prevented by a handicap or a limiting physical environment. It requires minimal gear.</td>
<td>Cycling is considered the most difficult between the three, requiring balancing practice on two-wheeled bicycles.</td>
</tr>
<tr>
<td>Story Pace</td>
<td>Slow (limited speed) average: 5-6 km/h</td>
<td>Medium (depends on the person) 9-10 km/h</td>
<td>Fast (depends on many factors) average: 15-19 km/h</td>
</tr>
<tr>
<td>Flexibility of Movement</td>
<td>Flexible.</td>
<td>Flexible.</td>
<td>Less flexibility due to speed, access, and ergonomics.</td>
</tr>
<tr>
<td>Body Flow (Biomechanics)</td>
<td>Upper body movement is resulting in a slightly shaky footage upon attaching wearable cameras.</td>
<td>Vigorous Upper body movement is resulting in an extremely shaky footage upon attaching wearable cameras.</td>
<td>Upper body movement is minimal, which provides a less shaky footage upon attaching wearable cameras.</td>
</tr>
</tbody>
</table>
3.2 Ethnography

When describing an Active Sports Storytelling scenario, the mix will always depend on people consisting of a dynamic relationship between a storyteller and an audience receiving such stories. This section will elaborate more about such relation showing some user surveys and interviews that helped to clarify each side of this relationship, highlighting few insights and needs while showing its importance in making such experience work.

User Surveys

An early survey was sent to evaluate the current situation and identify key points and opportunities that can be tackled through the initial experiments. This survey was distributed through social media, and the questions were mainly to measure habit formation, engagement, and motivation to perform sports mainly running, and walking. Along with few side questions concerning the use of technologies and sharing to social media during or after the activity. The received results reached 7587 responses. The list of questions and full results can be found in the appendix section of this thesis. However, few points are worth mentioning that helped us in the direction of the following experiments and test cases.

1. **Demography**: The vast majority of the participants were from Saudi Arabia 87% (6593 participants). While more then half were young adults 60% (4520 participants) aging between 17 and 25 years old. (Figures 3.1 & 3.2)

2. **Social Influence**: The biggest insight came from answering this question Watching another person performing a walking or a running activity, motivates you to do the same? which resulted in 61% (4597 participants) of the responses saying Yes, every single time (Figure 3.3). That insight supported the assumption we had initially about social influence along with many other previously done studies especially for the young aged audience (Keresztes et al. 2008) and how coupling it with engaging storytelling can create a motivating experience for more people to become active performers and potentially adopt such activity into a habit and become active storytellers themselves.
Do you currently reside in Saudi Arabia?

7587 out of 7587 people answered this question.

- Yes: 6303 (87%)
- No: 994 (13%)

Figure 3.1: Sample result from the survey.

Age

7587 out of 7587 people answered this question.

- 17-25: 4520 (60%)
- 26-35: 2064 (27%)
- 36-45: 460 (6%)
- 46-55: 343 (5%)
- 56-65: 163 (2%)
- Show more (2)

Figure 3.2: Sample result from the survey.

Would watching someone else performing an activity motivates you to do so?

7587 out of 7587 people answered this question.

- Yes, every single time: 4597 (61%)
- To an extent: 2118 (28%)
- It depends on the person and whether I know him/her: 512 (7%)
- No: 344 (5%)
- Other: 16 (0%)

Figure 3.3: Sample result from the survey.
Interviews

Few interviews have been conducted with both already existing active performing storytellers who used existing tools to tell stories of their activities on social media trying to understand what motivates them to do so, and what kind of challenges they face while they try to record and tell these stories. The first interview was conducted with Joseph Tame a 34 years old resident in Tokyo from the United Kingdom, he have been running since 2008 and have been constant for him is logging his runs. According to him If it cant be logged, its not worth doing thus he was keen of logging his activities that became an expressive form of art that he enjoys expressing to people and people enjoy watching these resulting forms of what is called GPS art, where he would plan his route to draw a figure or write a word on grand scale of the map through running and GPS tracking. Another Interview was conducted with Ahmad Alsharidah, A 26 years old student in Japan from Saudi Arabia who likes cycling around in Tokyo where it is easy for him to do so compared to back at his hometown in Saudi Arabia where the infrastructure and the weather makes is hard to do so. Ahmad talks about how cycling became part of his commuting routine. He likes to go out for cycling trips during weekends and found it entertaining to share what he sees to his friends family and followers on social media through Snapchat and Instagram, as people see these pictures and short clip videos they always send back positive feedback expressing their desire to visit Japan one day and try cycling at the same routes as he took by themselves. Ahmad argues that this also might have some cultural aspects to it as the majority of the followers on his social media accounts are people from Saudi Arabia where as mentioned earlier with very few developed infrastructure at the moment for the cyclist, posing difficulties especially for females to be cycling or running in public. He finally adds that active sports storytelling can be an effective method for promoting tourism for a certain areas or cities if told in an engaging way.

3.3 Target Persona

The target persona for such an experience can be described in two folds.

Heroes: Active Storyteller

The Active Performing Storytellers or what can be described as The Heroes of the Story. Those who fit such a profile are usually active young athletes in their
twenties with a considerable activity on social media. They are outgoing, curious and love traveling and exploring new places. They have a tendency to take care of others and show people around acting like tour guides. They enjoy sharing new information and their experiences with others while listening to their feedback for improvement and reassurance.

**Side-Kicks: Active Audience**

The Active Audience or what can also be called Sidekicks for the heroes. Those who fit such profile are mostly youngsters who also consume social media content. Most of them have an interest in sports with difficulty to perform it for various reasons either social, environmental or physical reasons. They are curious and like to explore new places and different lifestyles. They are constantly looking for motivation and entertaining content online for past time activity.

### 3.4 The Design of the User Experience

The definition of User Experience varies relying on the context. Some characterize it as basically "enjoyment" or "freshness." Others, as D.A. Norman, Ph.D., explains that one of the necessities for a good User Experience is "to meet the exact needs of the user, without fuss or bother." The second necessity is "simplicity and elegance that produce products that are a joy to own, a joy to use." For Run With Me the experience is trying to capture both of the engagement and entertainment sides as well as simplicity and convenience.

**Defining the User Experience**

The experience can be defined as a system where Active Performers (HEROES) are telling a story while performing, utilizing existing wearable/portable storytelling tools, while sharing information and stories of their exploratory sports performance, describing the feelings they are going through at a certain moment. On the other hand, the Active Audiences (SIDEKICKS) are consuming these stories live while they are happening. They have a hand in creating the story by interacting with (HEROES) in several options chatting, asking questions, voting on polls and cheering, while exploring the story in a unique way that can differ from other users. (Figure 3.4)
The user experience development process is all about ensuring that no aspect of the users experience happens without planning for it. This means taking into account every possibility of every action the user is likely to take and understanding the users expectations at every step of the way through that process. For that, we followed a methodology introduced by Jesse James Garrett in his book "Elements of the User Experience" (figure 3.5) where the User experience can be broken down into its five component elements, so we can better understand the problem as a whole throughout the process of designing the experience, where each plane is dependent on the planes below it. In our context of Run With Me these five elements are defined as follow:

![Flowchart of RUN WITH ME’s flow of the User Experience](image-url)
Surface Plane:

HEROES: On the surface, a record of a live 360-degree video is made by a wearable camera on backpack mount attached to a gimbal while telling the story of the activity.
SIDEKICKS: On the surface, a live video of a performer is seen, showcasing his/her activity while interacting with the audience.

Skeleton Plane:

Wearable Cameras (GoPro Hero4), Backpack Mount, Gimbal (iKan 3xD), backpack to hold the mount (Camelbak), Smartphone with internet connection (iPhone 6), Live Streaming application (Periscope).

Structure Plane:

HEROES: Record Live Video → Talk, Label, Read.
SIDEKICKS: Watch Live Video → Chat, Vote, Cheer, Watch, Listen.

Scope Plane:
HEROES: Live broadcasting, Perform Active Sports.
SIDEKICKS: Chatting, Voting, Asking, Cheering.

**Strategy Plane:**

To create a convenient way for logging sports activities while telling entertaining stories that will engage and motivate a live audience into becoming active.

**The Final Experience**

By the end of these experiments the final setup that has been concluded, after the series of tests shown in Chapter 4, which satisfies the goals for active sports storytelling using the currently available tools is defined in the following experience:

The setup would be achieved by made by attaching a 360-degree camera on a stabilizing gimbal connected to the performers back-mount, which provides a 3rd person view connected wirelessly to the hand-held internet connected smartphone that is live streaming the content using an application to engage with the audience whom are enjoying the story and interacting through their internet connected smartphones that has application enabling them to watch, chat, ask and vote and participate in creating the story. Adding another user element to the experience namely the (MAIN SIDEKICK) who is chosen by the HERO to assist in the storytelling by acting as a facilitator where that character is the only one capable of communicating verbally to the HERO when he or she is focused on the performance and not looking at the screen, minimizing the distraction that can be caused to follow up with the stream of feedback from the general SIDEKICKS.

**Notes**

2. Nielsen Norman Group, *The Definition of User Experience (UX)*
Run With Me is an experiential concept designed to enable active sports performers to capture and share their activities with their audience in an engaging storytelling form conveniently. This section will be discussing the experiments that led to the final experience design while answering questions along the way that helped better understand and adjust the initial assumptions raised at the beginning of this research. However, for initial explorations, the focus was only shifted on whether a live-streamed run can be motivating for the audience. While the second hypothesis was focused on the best positioning of the wearable camera that can provide the best engaging POV for the audience.

4.1 Initial Experiments

Several experiments have been performed to test the optimal angle that makes it easy for a storyteller to perform his sports activity while capturing the best angle for an engaging story. These initial tests were done mixing and matching between various gadgets and cameras that are available in hand while also designing some custom mounts for the cameras to have various options which can be evaluated. This section will be discussing some of these set-ups, the reason they were considered and their feedback based on certain matrices that have been used in order to choose the preferred method that qualified for the final design, and later tested in the Live stream test-cases that will be discussed later in this chapter.

The test matrices were evaluated according to the following questions for each criterion shown in (Table 4.1):
### Table 4.1: Criteria for Testing

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearability</td>
<td>How comfortable is it to wear the camera on the body without having it interfere with the performance or activity? How safe is it to perform the activity in this mode? Not only on the performers but also to the people and environment surrounding them?</td>
</tr>
<tr>
<td>Stability</td>
<td>How stable is the image or recorded footage for the audience to watch in relation with the performed activity mode?</td>
</tr>
<tr>
<td>Engagement</td>
<td>How easy is it for the audience to engage with the environment and footage showing the activity?</td>
</tr>
<tr>
<td>Control</td>
<td>How much control does the performer have on the camera to be able to curate and tell the story?</td>
</tr>
<tr>
<td>Audio</td>
<td>How easy is it to record audio? How clear is the sound quality? And how much audio interference is caused by this method of mounting the camera and activity?</td>
</tr>
</tbody>
</table>

Each of these matrices was tested for Walking (hiking), running, and cycling. And in with different cameras and POV’s with some volunteering performers and the results of each of these experiments were recorded and summarized in the following sections.
4.2 First-Person View

First-person view (FPV), also known as the first-person point of view (POV), is the ability of the user of some technology to see from a particular visual perspective other than one's actual location, such as the environment of a character in a video game. However, when it comes to storytelling, its one of the first obvious viewpoints to think about for performers speaking directly about themselves. Thus, it was worth experimenting first and see how would the results turn out to be.

Chest-Mount Test

For these tests a GoPro Chesty (Chest Harness) was used along with several models of GoPro Action Cameras by two volunteers with three different activities: Walking, Running and Cycling. The feedback from these tests is shown in (Table 4.2).

Head-Mount Test

Another set of tests were done using a GoPro Head Strap with several models of GoPro Action Cameras by two volunteers with three different activities: Walking, Running and Cycling. The feedback from these tests is summarized in (Table 4.3).

4.3 Third-Person View

In video games, "Third-Person" refers to a graphical perspective rendered from a fixed distance behind and slightly above the player character. This viewpoint allows players to see a more strongly characterized avatar and is most common in action games and action adventure games. There are primarily three types of third-person camera systems: the "fixed camera systems" in which the camera positions are set during the activity; the "tracking camera systems" in which the camera simply follows the performer; and the "interactive camera systems" which can be controlled remotely through another agent. In these tests, we explored the second type of third-person view, the Tracking Camera System. For its technically easier to achieve when rendering a 3D animation or Video Games, but in the real world to have a camera following the performer without the need of another human.
being (camera man) can be quite challenging. In this section, we present a list of tests striving to achieve the optimal Tracking view that works well in the context of sports storytelling.

**Flying Follow Drone Test**

One of the distinct ways to achieve such a view is to use a drone that follows the performer while hiking, running or cycling. A test has been done with a volunteer runner using a Hexo+ drone, which has a 3D-Axis Gimbal and a GoPro Hero 3+ Camera attached to it. The main reason why the Hexo+ Drone was chosen for this test is its GPS sensor and Mavlink protocol that allows it to follow the performer holding the phone without the need to control flying the drone during performing the activity. The results from these tests are summarized in (Table 4.4).

In addition to the mentioned test feedback, there are other major issues that only applies to the case of using a drone. The first issue was the short battery life, which lasts for only 12-15 minutes of flying time. This could affect both the performance and storytelling experience, especially if its planned to last for more than 12 minutes. Second, is regulation for flying drones in public as its becoming more strict and difficult to fly them within the limits of the city without a proper permission depending on the location of the performance and story.

**Hand-held Mount Test**

Holding the camera in hand is probably the easiest and most intuitive way to record a story for the flexibility and control the performer can have. But in the context of sports storytelling, this might not be the ideal case. However, we gave it a try in this test using a GoPro 3-Way Mount for it can provide the performer an easy way to hold and control the storytelling tool (camera) in hand while performing the activity. Additionally, we have experimented with using a 3D-Axis gimbal (ikan 3-Axis Gimbal Stabilizer for GoPro) in few of the test cases in that mode. The feedback from these tests is summarized in (Table 4.5).

**Custom-Made Back-Mount**

For these tests a custom made back mount was made using Polyvinyl chloride (PVC) plastic pipes and a standard tripod mount 1/4-20 (1/4” diameter, 20
threads per inch) for attaching different types of cameras over the back and behind the performer’s shoulder. The purpose of making such mount is to provide an option for attaching the storytelling tool to capture the performance story without interfering or interrupting while providing an engaging angle of view to the audience. This prototype went through several iterations in order to make it comfortably wearable while ensuring its stability on the back of the performer. Theses iterations started by adding a bottom pouch sewing few back straps that connect on the chest of the performer with a help of a clip (Figure 4.1). These were later found not sufficient for holding the mount properly, and shakiness was still severe upon movement. On the next upgrade we combined the mount with a running hydration backpack (Camelbak) and replaced the mount with the water reservoir which snugged in perfectly. This was proven to enhance the experience for the performs and reduce the shakiness in the footage while increasing its wearability, this version of the prototype was then used in the following tests.

![Figure 4.1: The custom made back-mount early prototype](image)

**Back-Mount with GoPro Test**

The mount was tested using a GoPro Hero4 with a volunteering performer who tried it with Walking, Running, and Cycling. These tests were done in two parts, one without a gimbal and another with a 3D Axis Gimbal (ikan 3-Axis Gimbal
Stabilizer for GoPro) and with a help of a volunteering performer. The results of these tests were summarized in (Table 4.6).

**Back-Mount with Theta S (360-degree Camera) Test**

Another set of tests were done using a RICOH Theta S Camera that has a capability of shooting 360-degree footage. This is a useful feature that solves the issue of having to direct the camera in certain directions, and could affect the experience of the performer and the audience. A volunteering performer wore the back mount with the RICOH Theta S 360-degree camera. The results were summarized in (Table 4.7).

![Figure 4.2: An un-stitched 360-degree sample of a Running test with the back-mount](image)

**4.4 Live-Streaming Test Case**

With all the initial test that has been running to find the best angle for broadcasting, another test was conducted in parallel that focused on creating a socially engaging experience between the performer and the audience. In these tests a volunteer with a considerable following on a live streaming service was recruited to run this experiment.

These experiments were done over two iterations once with Gimbal and once without. And was tested varied between walking, running and cycling. In each of
these experiments the performer was live-streaming his activities from his internet connected smart-phone using a live-streaming application named Periscope. In some test cases, the live broadcasting was streamed from a wifi connected GoPro Hero4 attached to a chest strap using the GoPro Chesty (Chest Harness), while in other cases it was attached to the custom made back mount or hand-held by the performer during the activity. The list of tests performed and their set-ups are shown in (Table 4.8).

These tests were all recorded by the performer showing his story as well as the feedback provided by the audience in real time. With the help of the existing features of the used application Periscope, the audience were able to engage with the performer’s story through live chat stream and screen tap cheering features. The audience seemed more engaged every time the performer addressed them directly (turning the camera towards him), especially when he offered them opportunities for contributing to the story by voting, e.g. “Should I go left or right?”, “Should I stay longer in the forest?”. He would like to get some statistics about this feedback (how many users said ”right” over ”left” etc.). Thus, in experiment #7 a browser extension (on Google Chrome) named ”Chatterbox for Periscope” was used to determine the number of votes for a question asked by the audience. This extensions function compares the appearance of two strings within the periscope chat and translates it into a graphical presentation of a poll in real time making it easy to the performer to decide which decision to follow while keeping the
audience engaged.

In the interview, the runner was surprised that the first trials were so successful. He expected people to leave or stop watching after few minutes, but surprisingly the majority remained watching and engaged until the end. He wants to continue runs exploring different areas and thinks it is an interesting new way to tell informative and engaging stories to his audience about new places. However, he raised frustration over the streaming application, as its not fit for running. Holding the smart-phone in the hand the whole time or having to check the screen constantly might interrupt the performance. Also viewing angles and direction of the camera are not optimal and sometimes difficult to adjust. These issues were also confirmed by the audience in the following distributed surveys where many raised complaints about the direction of the camera at some instances (especially during cycling where the camera was facing down for a considerable part of the test) while other concerns were addressing the quality of the connection.
Post Live-Streaming Survey Results

Post the final tests #5 #6 #7, a survey was given to the live audience to capture some extra feedback other than what has been written in the live chat feed. Around 371 participated in the survey. The questions and its summarized results can be found in the appendix section of this thesis. Included translated highlights from the survey feedback.
Table 4.2: Chest-Mount — Test Feedback

<table>
<thead>
<tr>
<th>Wearability</th>
<th>Wearing the chest mount was fairly the same for the three different modes, it was safe tucked in place.</th>
</tr>
</thead>
</table>
| Stability     | **Walking**: The image was a bit shaky due to the core body’s continuous movement, which made the footage unpleasant for watching.  
**Running**: The image was a very shaky due to the core body's vigorous movement, which made the footage unsuitable for watching.  
**Cycling**: The image was fairly smooth, the condition of the road could affect the stability of the image, this stability is due to the core body's relative stillness compared to walking and running, which made the footage more suitable for watching. |
| Engagement    | **Walking**: As the pace of the image is relatively slow, the audience can engage with the content of the footage to an extent as the chest mount is only showing the direction of the performer’s path.  
**Running**: The engagement is a bit more difficult due to the unstabilized image and fast pace of movement in addition to the limitation of the field of view to be only toward the path of the performer.  
**Cycling**: The view of the hands and bars while cycling can give a feel of riding the bike, however, this is with limitation to look right or left as the angle of view is fixated to the center due to the body posture of the performer on the bike. |
| Control       | Since its attached to the chest, the only way to show different views and content is via moving the whole chest in the direction of where the performer would like to log the story, which is unnatural and could interfere with the experience especially during running, and even more during cycling. |
| Audio         | It depends on many factors, but mainly on the casing. The sound of the performer is can be heard without difficulties due to the proximity of the camera to the performers sound source, though this can be interrupted during movement with any friction to the chest harness during the performance, and wind blowing into the camera microphone was an issue, especially during faster, paced sports such as running and cycling. |
Wearability — Wearing the camera on over the head was less comfortable to the participant compared to the other mounts such as chest or back which were tested in other experiments. It was also fashionably less preferable to the performers.

Stability

<table>
<thead>
<tr>
<th>Activity</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking &amp; Running</td>
<td>The image was a bit shaky with many sudden rotations due to the head’s continuous movement, which made the footage unpleasant for watching.</td>
</tr>
<tr>
<td>Cycling</td>
<td>Less shakiness compared to walking and running but the sudden head rotations can affect the stability of the image.</td>
</tr>
</tbody>
</table>

Engagement

<table>
<thead>
<tr>
<th>Activity</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>The pace of the image is relatively slow, which allows room for audience engagement limited to the performer’s field of vision and head direction at that recorded moment.</td>
</tr>
<tr>
<td>Running</td>
<td>The pace of the image is a bit faster, which results in less audience engagement while still being limited to the performer’s field of vision and head direction at that recorded moment.</td>
</tr>
<tr>
<td>Cycling</td>
<td>The pace of the image is relatively fast, yet more stable due to the minimum upper body movement. Which allows room for audience engagement limited to the performer’s field of vision and head direction.</td>
</tr>
</tbody>
</table>

Control — Since the camera is attached to the head strap, the only way to show different views and content is through moving the head in the direction of where the performer would like to log the story, which makes it easier for the performer.

Audio — It depends on many factors, but mainly on the casing of the GoPro. The sound of the performer can be heard without difficulties due to the proximity of the camera to the performers sound source. However, this can be interrupted during movement with any friction to the head strap (or helmet in case of cycling) during the performance. The wind blowing into the camera’s microphone was also an issue especially pace of movement becomes faster.
Table 4.4: Flying Follow Drone — Test Feedback

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearability</td>
<td>There are no gadgets to wear in this mode which makes it a preferred mean of logging for minimal performers who prefer not wearing or carrying more gears with them while running. The only item to be held during the performance is the phone which will be connecting wirelessly with the Drone to achieve the follow action.</td>
</tr>
<tr>
<td>Stability</td>
<td>The Hexo+ Drone is equipped with a 3D-Axis Gimbal that assists in a stable and steady image throughout the shooting.</td>
</tr>
<tr>
<td>Engagement</td>
<td>This mode can be very engaging to the audience as it can deliver a unique unfamiliar birds-eye view of the performance.</td>
</tr>
<tr>
<td>Control</td>
<td>The Hexo+ Drone has built-in predefined commands where the performer can choose from before the drone takes off. However, once this mode is set it can not be changed until the drone lands down to switch to another mode of flying; which means the performer can not control the drone while its flying except for making it terminate the flight and land. During the tests, the drone flying patterns were unpredictable which made it not safe to fly within the city or close to obstacle and trees. Since it also does not have an obstacle avoidance mechanism.</td>
</tr>
<tr>
<td>Audio</td>
<td>Nothing can be heard from the performers as the drone is flying relatively far and the sound of the drones fans are preventing any other sounds to be heard. (this can be solved by having a different audio source accompanying the performer during their activity).</td>
</tr>
</tbody>
</table>
### Table 4.5: Hand Held Mount — Test Feedback

| Wearability | **Walking**: It felt easy and intuitive for a while, but the hand might get tired after a while, especially if it’s a long walk or hike.  
**Running**: The runner felt not in ease holding the mount while running and holding such an object. *This was tested with only walking and running but not cycling for it’s risky to hold the gadget in one hand while steering with another.* |
|-------------|-------------------------------------------------------------------------------------------------|
| Stability   | **Without Gimbal**: The image was a bit shaky due to the core body’s continuous movement, it shows more shakiness during running than walking.  
**With Gimbal**: The image stability improved significantly and became stable and level due to attachment to the gimbal. |
| Engagement  | **Without Gimbal**: Its difficult for the audience to engage with the footage for its shakiness, but it has a higher advantage due to better control by the performer where he/she can choose what to show and talk about more flexibility compared to other modes.  
**With Gimbal**: The footage became more engaging due to the stable image combined with a wide angle shooting and performs control. |
| Control     | In this mode, the control scores higher than other methods of mounting due to having the camera in the hands of the performer, where he/she can direct the story and footage to where they intend to show easily. |
| Audio       | The sound of the performer can be heard without difficulties due to the proximity of the camera to the performers sound source. |
Table 4.6: Back-Mount with GoPro — Test Feedback

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearability</td>
<td>Wearing the backpack with the custom-made mount in it could be uncomfortable for someone who is not used to it. Especially during running where it starts moving back and forth with the possibility of increased friction if the backpack is not tightened properly. That can make some performers uncomfortable wearing the back-mount.</td>
</tr>
</tbody>
</table>
| Stability    | **Walking**: Without Gimbal: The image was a bit shaky due to the core body's continuous movement, and the mount pole moving back and forth which made the footage unpleasant for watching. With Gimbal: The image stability improved significantly and became stable and level due to attachment to the gimbal.  
**Running**: Without Gimbal: The image was a bit shaky due to the core body's vigorous movement, and the mount pole moving back and forth which made the footage unpleasant for watching. With Gimbal: The image stability improved significantly and became stable and level due to attachment to the gimbal.  
**Cycling**: Without Gimbal: The image was fairly smooth, however the condition of the road could affect the stability of the image. This is due to the core body's relative stillness compared to walking and running. With Gimbal: The image became even more stable regardless of the condition of the road. |
| Engagement   | Without Gimbal: The effect of shakiness is reduced in this mode as the body and head of the performer is a constant in the frame.  
With Gimbal: The footage became more engaging due to the stable image combined with a wide angle of view showing part of the performer interacting with the environment around him/her. |
| Control      | Since it's attached to the mount, the only way to show different views and content is via moving the whole body in the direction of where the performer would like to log the story, which is unnatural and could interfere with the experience especially during running, and even more during cycling. But it's easier compared to the First Person View as the camera is positioned further back which shows a wider field of view. |
| Audio        | It depends on many factors, but mainly on the casing of the GoPro. The sound of the performer can be heard but not very clearly due to the distance between the camera and the performer's sound source which is directed to the opposite side of the camera. |
### Table 4.7: Back-Mount with Theta S (360-degree Camera) — Test Feedback

<table>
<thead>
<tr>
<th>Category</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wearability</strong></td>
<td>Wearing the backpack with mount in it could be uncomfortable for someone who is not used to it. Specially during running where it starts moving back and forth that makes the performer uncomfortable wearing the back-mount.</td>
</tr>
</tbody>
</table>
| **Stability**   | **Walking:** The image was a bit shaky due to the core body’s continuous movement, and the mount pole moving back and forth which made the footage unpleasant for watching.  
                   **Running:** The image was a bit shaky due to the core body’s vigorous movement, and the mount pole moving back and forth which made the footage unpleasant for watching.  
                   **Cycling:** The image was fairly smooth, however the condition of the road could affect the stability of the image. This is due to the core body’s relative stillness compared to walking and running. |
<p>| <strong>Engagement</strong>  | The footage captured in a 360 view giving a new perspective to the audience where they can navigate around and engage as the performer continues doing his performance. Factors that could affect the engagement of the audience can be the shakiness of the image, or having an obstacle in the way such as the mount itself or the body of the performer if he/she is close enough to the camera. |
| <strong>Control</strong>     | The 360 view gives less need for directional control from the performer to show around as the user have a full view of the scene, and can navigate with there head around as the please. |
| <strong>Audio</strong>       | The sound of the performer can be heard but not very clearly due to the distance between the camera and the performers sound source which is directed to the opposite side of the camera. |</p>
<table>
<thead>
<tr>
<th>Exp.#</th>
<th>Activity</th>
<th>Logging Mode</th>
<th>Location</th>
<th>Distance</th>
<th>Live Audience</th>
<th>Duration</th>
<th>Gimbal Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Run</td>
<td>Hand-held iPhone</td>
<td>Hiyoshi</td>
<td>8 km</td>
<td>648 live</td>
<td>65 min</td>
<td>Without</td>
</tr>
<tr>
<td>2</td>
<td>Run</td>
<td>Chest Harness GoPro</td>
<td>Hiyoshi</td>
<td>4 km</td>
<td>256 live</td>
<td>19 min</td>
<td>Without</td>
</tr>
<tr>
<td>3</td>
<td>Walk</td>
<td>Chest Harness GoPro</td>
<td>Hiyoshi</td>
<td>500 m</td>
<td>234 live</td>
<td>2 min</td>
<td>Without</td>
</tr>
<tr>
<td>4</td>
<td>Cycle</td>
<td>Bike-Mount iPhone</td>
<td>Setagaya Tama- gawa</td>
<td>6 km</td>
<td>1088 live</td>
<td>32 min</td>
<td>Without</td>
</tr>
<tr>
<td>5</td>
<td>Walk</td>
<td>Back-Mount Gopro</td>
<td>Komazawa Koen</td>
<td>100 m</td>
<td>381 live</td>
<td>8 min</td>
<td>With</td>
</tr>
<tr>
<td>6</td>
<td>Run</td>
<td>Hand-held Gopro</td>
<td>Komazawa Koen</td>
<td>2 km</td>
<td>509 live</td>
<td>16 min</td>
<td>With</td>
</tr>
<tr>
<td>7</td>
<td>Cycle</td>
<td>Back-Mount Gopro</td>
<td>Komazawa Koen</td>
<td>2 km</td>
<td>323 live</td>
<td>11 min</td>
<td>With</td>
</tr>
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Chapter 5
Results & Discussion

Run With Me is an experiential concept designed to enable active sports performers to capture and share their activities with their audience in an engaging storytelling form conveniently.

5.1 Conclusion

This research proposes a new way for experiencing sports through storytelling and interaction between active sports performers and their audience. The proposed experience design apart from contributing to the sports field creates new opportunities for telling storytelling and logging experiences that can serve multiple benefits for active performers who in hand can influence their peers adding a form of social accountability in practice by bringing them into the experience of sports performance as a motivational element. This point was proven by through survey feedback and audience participation assuring that watching others performing sports, especially when coupled with an engaging story, can boost their motivation to become active themselves. This experience design also highlights how effective storytelling when implemented in the sports context, can effect positive behavioral changes such as habit formation or motivation to perform certain sports. The other fold this research is tackling is engagement through storytelling, exploring the best way to capture the activity without interrupting the performance while still provide a stable engaging footage the audience can watch and enjoy. This research suggested that capturing footage in a 360-degree view from a 3rd person perspective would provide the best experience for engagement available yet, especially if it was experienced by the audience through VR Virtual Reality Goggles. However, up to this end, the data and feedback are only suggesting but not proving yet that this is optimal mode of storytelling available.
5.2 Design Limitation

This research faced a few number of limitations during the process of designing the experience, especially during the test cases. This section will address some of them and provide suggestions on how to overcome them in the future. First, was the weak internet connection at several occasions of the live-streaming test, which affected the quality of the story and the experience the audience and the performer are going through. This could be overcome in the future by having better, faster internet connectivity either by having an improved infrastructure by the location in which the story is being performed at, or by the availability of better devices that can handle and process data faster. Another issue was the inability to broadcast 360-degree footage via smart-phones, as the only possible way to do it now is through connecting it to a computer for processing and stitching the footage requires some technical capabilities that smart-phones and small hand-held devices are not capable of yet. A suggested solution was to connect the camera to a mini-computer that the performer can carry along with him during his/her activity, but such offer was not available for this research.

5.3 Addition Findings

Cultural Context

Through conducting the live-streaming test in this research, several cultural discoveries were made from the social context of the participating audience. Since the majority of the following audience to our volunteering performer were from Saudi Arabia, while these tests were performed in Japan. Many reported feedback’s were referencing to the reason of engagement being due to the cultural experience they are engaging with, as the performer is showing a different part of the world in which they are not familiar with. Another reason was evident especially in the cycling test, where some comments by the audience expressed their wish to experience such a thing by themselves, as cycling infrastructures where most the audience are from is lacking or culturally inappropriate.
5.4 Future Work

This project has discovered several opportunities for improvement and investing in. As it’s an experiential design, it will always evolve to coop with the user’s ambitions while still strive to achieve it’s main goals which are engagement with the sports while motivating for an active lifestyle. This section will discuss the future ideas and plans for continuing this work and improving on the lacking points at the moment either for the lack of sufficient data or available technology to achieve the goal.

1. Continue exploring different ways for broadcasting 360-degree footage where the audience can engage with in real-time.

2. Connect Sports Storytelling concept with Sports Tourism, where such storytelling can be utilized in promoting different areas, cities or parks nation or international wide.

3. Provide Opportunities for people with disabilities to enjoy virtual tours and co-create stories with active performing storytellers. For example, to climb Mount. Everest while they are in their setting at home.

4. Develop an independent software application that incorporates the lacking features of voting and interacting specifically for sports storytelling context.
References


Appendix

A Surveys & Feedback

Pre-Survey Questions

Which active sport do you perform more often?
- A Running
- B Walking
- C Other

Do you perform it on weekly regular basis?
- A Yes
- B On and Off
- C No

How many times per week? Scale from 0 to 7.

In your opinion what are the challenges you face when trying to stick to an active routine?
- A The weather is harsh
- B No suitable places to run or walk
- C I’m so busy and don’t have time
- D I’m just lazy, don’t feel like it
- E I have an Injury or a disability
- F Other

What motivated you to start?
- A The scale, I’m overweight
- B I was influenced by someone else
- C My clothes are not suitable anymore
- D My look in the mirror was not pleasant
• E To cope with my daily stress
• F Read about it’s benefits in a magazine
• G Trying a new sports app or gadget
• H Advised by a Doctor or a Personal Trainer
• I Other

Do you carry your smartphone with you while performing your activity?
• A Yes
• B Sometimes
• C No

Why would you not carry your smartphone with you?
• A It’s Heavy
• B I don’t need it
• C It’s distracting
• D I have a sports watch
• E I don’t have a smartphone
• F Other

Why carry your smartphone while running/walking?
• A To use the camera
• B To log my steps and activity
• C To answer urgent calls
• D Listening to audible material
• E Other

What do you mostly listen to while performing your activity?
• A Music
• B Audio Books
• C Podcast
• D Chat on the phone
• E Nothing, I run/walk headphone less
• F Other

What apps do you use for tracking your activities?
• A Strava
• B Nike+ Running
• C RunKeeper
• D Runtastic
• E Map My Run
• F No
• G Other

Have you ever shared your activity on social media?
• A Yes, almost every time
• B Sometimes, and in rare occasions
• C No, not at all

Which of the following social network applications have you used to share your activity?
• A Facebook
• B Twitter
• C Instagram
• D Snapchat
• E Other

What type of media did you share about your activity?
• A Video
• B Photo
• C Text
• D Numbers
• E None of the above
• F Other

What motivates you to share your activity or story on social media?
• A To inform others of products I care about and potentially change opinions or encourage action
• B I enjoy getting comments and recognition from others. It makes me feel valuable
• C To give people a better sense of who I am and what I care about
• D It lets me connect or stay connected to people who share my interest
• E To bring valuable and entertaining content to others
• F Other.
Watching another person performing a walking or a running activity, motivates you to do the same?

- A It depends on the person and whether I know him/her or not
- B Yes, every single time
- C To an extent
- D No
- E Other

Gender
- A Male
- B Female

Age
- A -16
- B 17-25
- C 26-35
- D 36-45
- E 46-55
- F 56-65
- G 65+

Job
- A Public Sector Employee
- B Private Sector Employee
- C Part Time Job
- D Student
- E Retired
- F Other

Do you currently live in Saudi Arabia?
- Y Yes
- N No

Where do you live now? (optional)
Post-Survey Feedback (Translated)

Positive:
Fun, entertaining, energizing. (engagement) I felt more involved watching the experience live. (engagement) I bought a bike after watching your broadcast, the last time I had one was when I was 8 years old. (motivation) The experiment was fun for the most part, I felt like Im emerged and a different part of the world. (engagement) I found it entertaining. Its not common to see someone broadcasting live their sport activity. (engagement) It inspired me to go out for exercising, in an entertaining way. (motivation) watching other people who share me the same interest motivates me to do more! (motivation) The person performing the activity matters as much! Because I am not too interested in sports, but I was also excited and inspired to start running, so thank you. The live broadcasting made it more interesting with all its spontaneity. It was fun, I didn't feel the time passing. I'll be interested to see what you do next. Besides you have great stories and sometimes you give interesting info. And it's a motivation to run and exercise as well as the fact of someone doing something they're passionate about is inspiring. Im curious to see how you run, and cycle. And to see the places you go to. I really enjoyed the experiment, even though it was short. I wish to see more next time, why don't you go climb a mountain? Very engaging, I liked more the parts where I see parts of the performer's shoulders and head. Talking with us and mentioning interesting facts about the place increased my engagement! Watching the video LIVE was way much engaging than waiting for this person to come back home and tell me the story of his trip or hike!

Constructive:
The quality of the connection was not good at some points. (connection) the direction of the camera at the cycling part was facing down. (control) It was boring at some points, it would be more fun if you were talking about what you see or if you were chatting with someone with you along the way like the last cycling experiment. There was not much benefit except for a slight motivation that I got at the beginning, did not deserve a long broadcast. Make it shorter, Its fun to watch but not for more than few minutes. It would be better if we can see a more wide view of the experience. The continuous adjusting of the camera position was annoying. It would be better if a text appeared at the beginning showing the name of the place and the type of the experience. The position of the camera (specially during cycling) should be fixed. The microphone should be protected from the wind, it was annoying to hear the wind when you go on high speeds on the bike. it is kinda boring to watch the whole thing I would jump the scenes and maybe the place should be more interesting. The positioning of the camera, and something for the sound of the wind. If you can find a way to control the pipe and stabilise it more. Also covering more than one direction would make the experience more enjoyable. The recording quality wasn’t the best, so if you could use maybe a better camera or probably it was an Internet problem so maybe use faster internet or a device that improves the signal. It’s pretty cool to see new places and get some information but personally I don’t like watching these kind of stuff. But I was excited for yours because you’re a nice guy and I wanted to help a little. I think it was creative and fun cause I felt like I lived this experience. Maybe it needs a better quality camera. The sound quality when its behind the performer was not good. Watching such story again, depends heavily on the person giving the story. Well, if your aim was to share the
experience the camera prevented that because most of the time it focused on the runner or on the street. As viewers we were not able to enjoy the scenery as the athlete himself. I actually find the camera stability amazing just lacking a holistic view (left right up down) I have to say the view of the sky was amazing when you tilted the camera!! Good luck! As I mentioned in the last comment, also I know that there is an advanced video cam that has an automatic stabiliser it is pretty amazing, also I think athletes would be excited if they can share the video with bio data if possible like connecting it to strava or something like that, just a thought! I hope it helps good luck! I like watching people (certain people) perform sports. It would be better if it was less than 25 min.

B Interview Questions:

Pre-testing Q&A’s for Performers

Hero (The Performer): Pre-testing Q&A

What are your favorite active sports? Why?
What got you into it?
What is your source of information exploring new places to perform at?
So do you document/log your activity?
What methods do you use when documenting your activity?
What apps/props do you use for storytelling/recording your activity at the moment?
Can you give us examples?
Do you often share your logging of your performance? Why?
How important is it for you: The Story (or logging) vs. Performance?
From your perspective, why do people like to follow your performances?
Do you go back to your logged activity? How often do you replay your activity? What makes some footage enjoyable to watch again and others not?
Do you follow other performers activities?
What do you like about them?
Who do you find inspiring?
Do you try to emulate them?
Do you feel more motivated when people are watching you in real-time vs publishing your story after the activity has been already done?
APPENDIX B Interview Questions:

**Post-testing Q&A’s for Performers**

Did you feel comfortable sharing / documenting the experience?  
How engaged were you during the activity? {Scale}  
Would you log this activity again (using this method)?  
At the same place or in a different location?  
Did you feel more observant of the experience?  
What were the highlights of the experience? Positive and negative?  
Was reading the comments during the performance engaging/distracting?  
Were polls detrimental/engaging to your running experience?

**Post-test Q&A’s for Audience**

Are you likely to watch again? (Different locations? Different positions?)  
How much time did you think passed? {flow}  
Audio-visual quality?  
Were there any surprising highlights?  
Did it motivate you to perform this activity yourself?  
At a different or same place?  
Did it motivate you to want to share your activities like the performer did?  
What were the highlights of the experience? (+ -)  
Any lasting thoughts or remarks about the experience?  
Did you feel like you were experiencing the activity with the performer?  
Would you be interested in watching performers through live streaming?  
Was reading the comments during the performance engaging/distracting?  
Did you like the possibility to influence the performers actions through polls?