Report of SS11

VR/AR/MR Technology

Xiaoying ZHAO

Background information

- Intend to have survey on market and technology of VR products/systems, including
  - key features
  - typical use cases
  - customer requirments
  - .....
- Expected output may be
  - standard needs
  - critical parameters

Expert list of SS11

Team Leader	Ms.	Xiaoying	Zhao	CN	zhaoxy@cesi.cn
1(co-editor)	Mr.	Ockwoo	Nam	KR	phdnow59@gmail.com
2	Ms.	Kate	Grant	UK	ninetiles@yahoo.com
3	Mr.	Pekka	Talmola	FL	pekka.hk.talmola@nokia.com
4	Mr.	Nidhish	Parikh	FL	nidhish.parikh@nokia.com
5	Mr.	Kwang-Soon	Choi	KR	lenon@keti.re.kr
6	Mr.	Renwei	Chen	CN	chenrw@cesi.cn
7	Mr.	Yan	Fang	CN	barrel.fang@huawei.com
8	Ms.	Veronica	Lancaster	US	vlancaster@cta.tech
9	Ms.	Ulrike	Hatrich	DE	ulrike.hatrich@sony.com

Scope of SS11

- Try to list and carefully evaluate the techniques used in field of VR/AR/MR.
- Find out the potential requirements for standards.
- Provide new projects to TC100.
  - First start from VR.
  - A TR about VR market, technology and standard requirment will be provided.
  - A VR use case template will be provided.
  - More output can be expected.

Previous and future

From	To	What to do	What we want
2017-4-28	2017-5-5	First mail-based discussion	A brief outline of interested issues
2017-5-5	2017-5-9	Mail-based discussion on the report to AGS	Try to provide a proposal on a report of VR products/market/techniques.
2017-7-20	2017-9-14	Start prepare the draft of TR	TR: Market, Technology and Standard Requirements of VR.
2017-9-28		Discussion and comments about the TR Draft	A F2F meeting is held on Sep 28th.
2018 May		Discussion about the TR V2.0 Discussion about the use case template.	The material had been distrubited by email and Collaboration Tools. A F2F meeting will be held on May 24th.
2018 Oct		TR and use case template will be completed.	

Done

Done

Done

Will Do

Doing

Will Do

some changes in the TR -1

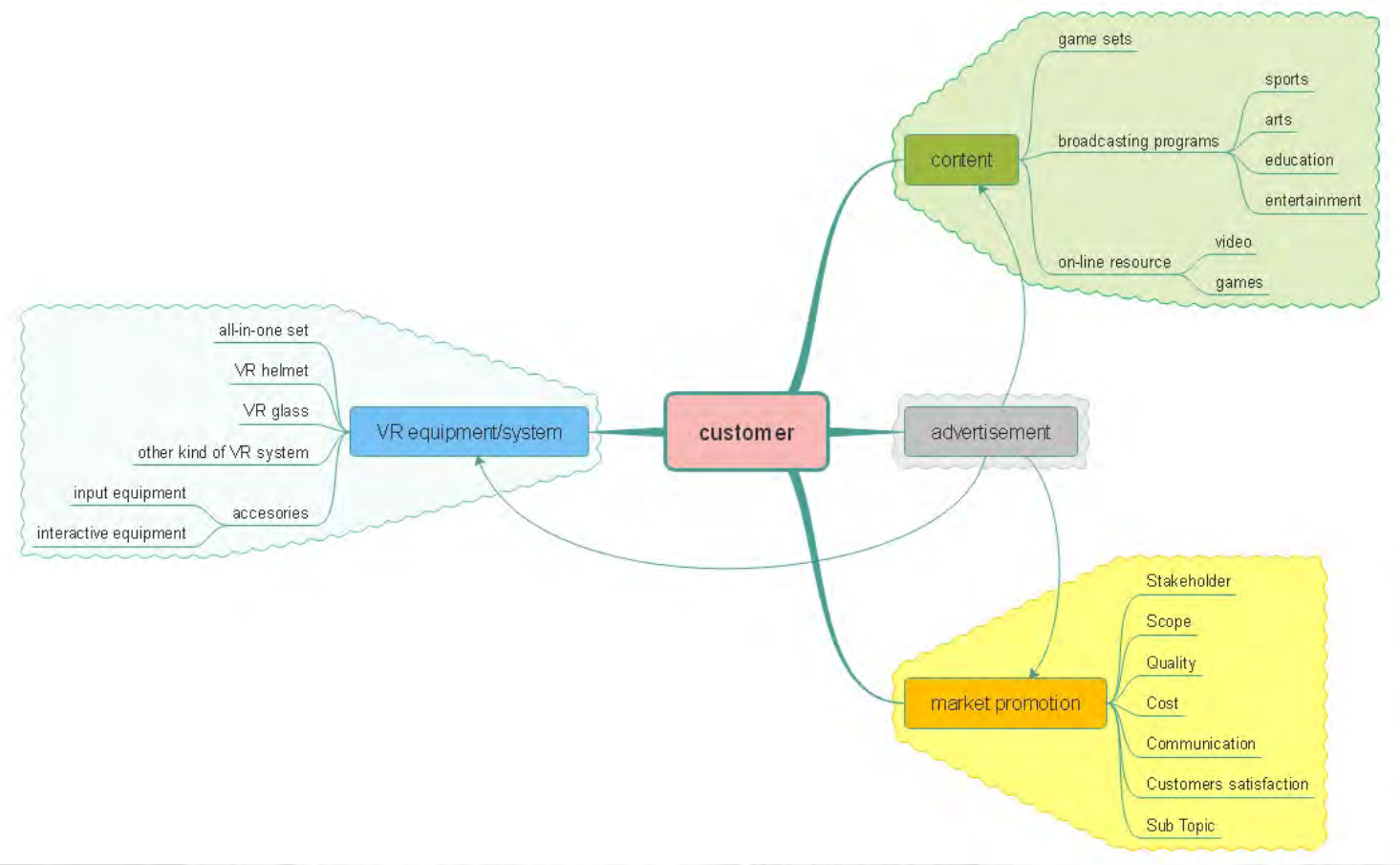
CONTENTS

FOREWORD 2
INTRODUCTION 4
1 Overview of VR technology 5
2 Markets of VR Equipment and System 6
3 Typical use cases of VR equipment 7
4 Technical of VR 8
4.1 Technical model of a VR equipment/system 8
4.2 Technical bottleneck of VR 10
5 Related work of other SDOs 10
5.1 Within IEC 10
5.2 In JTC-1 10
5.3 In ITU 14
5.4 Other allians and organizations 15
6 Recommendations 15
6.1 Expected standard framework for VR equipment/system 15
6.2 IEC Domains Impacted 15

Figure 1 Different types of VR equipment/system 5
Figure 2 VR business mode 7
Figure 3 VR Technical Domain 9
Figure 4 works about VR in JTC-1 11
Figure 5 VR standard framework 15

some changes in the TR -2

Modified the graph of VR bussiness model



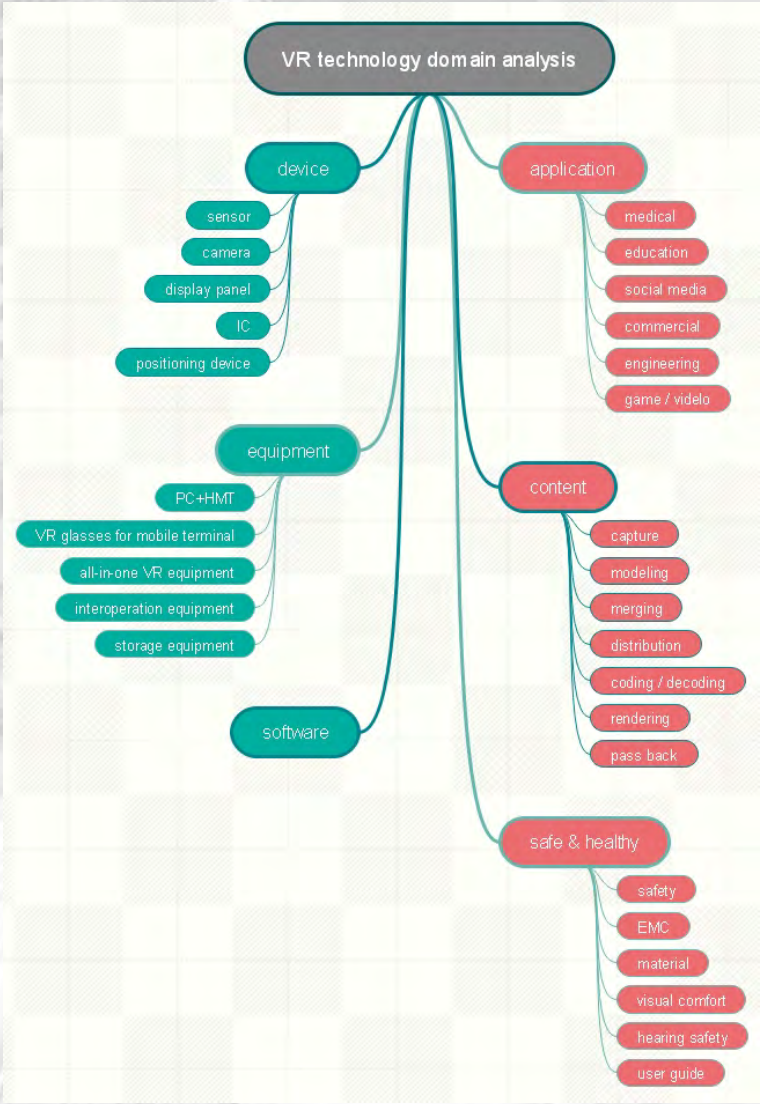
some changes in the TR -3

summarize the use case in a table.

used area	example	user	basic requirement
education and training	military	Soldiers, espacially in air force, are trained by VR systems. There are successful use cases in UK and US since 1980.	believable,Interactive,response time.
	Space	Astronauts, who are tained by using immersive VR to train astronauts while they are still on Earth, the simulation system also included a zero-gravity envirionment. NASA used the system to train their astronauts on how to spacewalk, and what it is like to work with tools in space while using low cost 3D printed mock up tools.	
	vehicle	Pilots and vehicle drivers, who have less opportunity on real-world experience. VR training can provide additional training time.	Immesive,Believable,Interactive,Response time.
	medical	Students can learn to treat patients without any risk. Through VR, medical students and novice surgeons have the ability to view and experience complex surgeries without stepping into the operating room.	immesive,Believable.
scientific research		Students, including some premior kids, and scientists, will have the chance to study for the activities in microcosmos, in space, in sea and all the environment that is impossible for common people.	Believable.
design and engineering		VR system help desiners to build computer models which can walk through and explore. This is an area where VR overlaps with : instead of simply making an immersive 3D visual model for people to inspect and explore, you're creating a mathematical model that can be tested for its aerodynamic, safety, or other qualities.	
art show	common visitors	Some museums have begun making some of their content virtual reality accessible Some trails have been made to take viewers back to the scenes of thousands years ago by using VR technology	
entertainment	video game	Several VR head mounted displays (HMD) were released for gaming during the early-mid 1990s.Following the widespread release of commercial VR headsets , several VR-specific and VR versions of popular video games have been released.	
	cinema and concert	Films produced for VR permit the audience to view a 360 degree environment in every scene. VR system also changed the way for enjoying a live music. It permit the audience to “participant” a performance from several different aspects. Some TV broadcasting and APP trailed.	

some changes in the TR -4

new graph to show VR technical domain analysis.



some changes in the TR -5

- related works in JTC-1 and ITU had been included.
  - still need confirmation.
- more information from other SDOs should be included.
  - need more input from group members.
- related IEC domains still need to be completed.

Use Case Template

VR Use Case Study Template

1 Description of the Use Case

1.1 Basic information

Provided by (NC, other SDOs)
Short description – max 3 sentences

1.2 Name of Use Case

ID	Name of Use Case	kind of production VR system (developed by seperated equipments) All-in-one VR system VR helmet VR glasses Other kind of VR system/equipment

1.3 Service scenario

main function of VR system/equipment	target user

1.4 Content played by VR system/equipment

kind of content	length of content

1.5 Source of content

content provider	file format	definition	interface of audio/video

1.6 Referenced Standards and / or Standardization Committees

Relevant Standardization Committees	Standards have to be considered in the Use Case	Standard Status

1.7 User requirements

User Requirements for VR system/equipment

2 Drawings or diagrams describing Use Case

Drawing or Diagram of Use Case – e.g. graphic depiction of use scenarios, and/or system/equipment functional, interaction with user

Details of person who completed this UC template:

Name:

Organization/Body represented:

Email:

Telephone:

I agree to being contacted in the case wherein the SS11 has any queries regarding this Use Case (please delete the response that is not applicable): YES/NO

VR Use Case Study Template V1.0 - 20160506

Proposal

- Get as much support as possible within TC100 for
  - Gathering information about existing products and technologies.
    - marketing data
    - outstanding companies & new products
    - new bussiness mode
    - any upcoming customer requirements about performace and accessibility of VR products/systems.
    - etc.
  - Any update of typical use cases.
  - Comments and suggestions.


Thanks for Attention.