VII Forum on Elite Sport –ASPC
Forum D: Innovations and Technologies for athletes' training in Elite Sport Centers

Computer Application for Sport: SMART-system
A Video Database for Sports

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Why I created a video database?

- Coaches and staffs have thousands of videos
- Video is the main tool for training
- Coaches and athletes want to share videos

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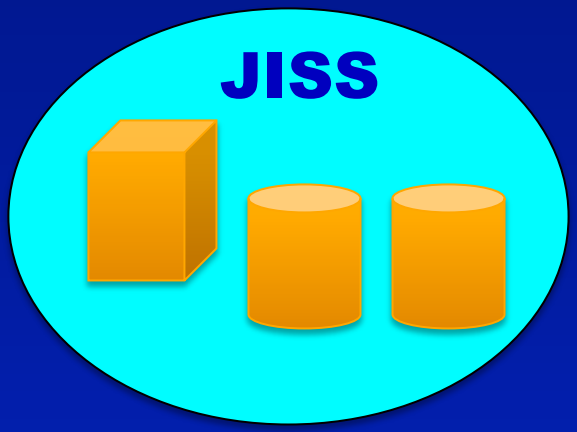
SMART-system is a



Streaming

Video database
For Sports

-Sports Oriented Viewing
-Easy searching method

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Distributed Streaming servers

Metadata servers in JISS

Streaming server

Streaming server

Authentication gateway

Authentication gateway

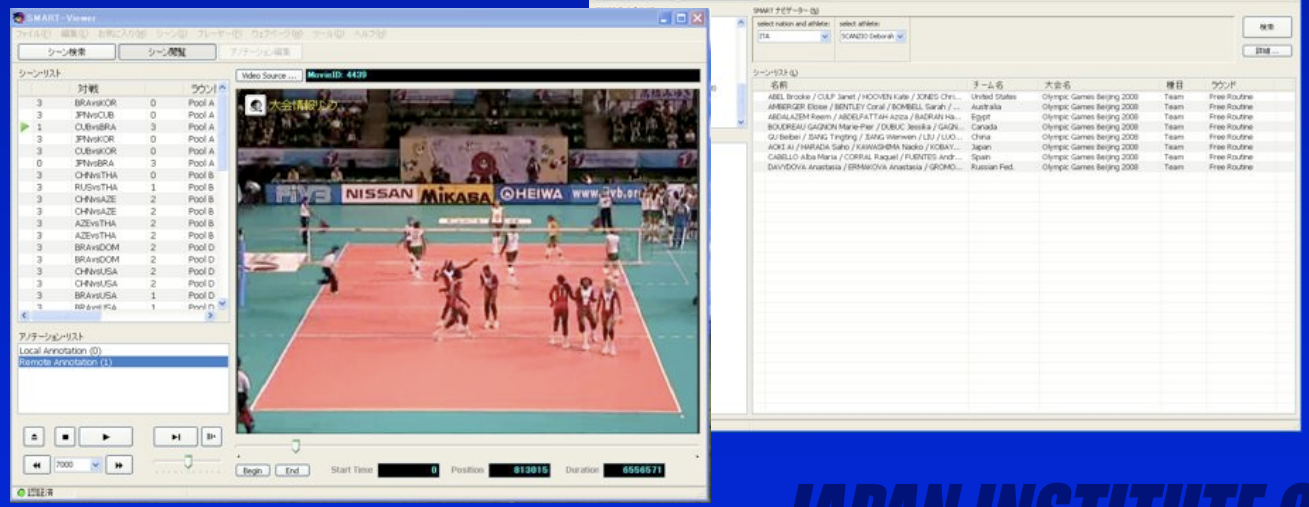
User server

Search server

Movie server

Logging server

The Internet



Client: SMART-viewer

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Brief history of SMART-system

- 2002: A commercial software was used
- 2003: Modify the commercial software
- 2004: We need our software!
- 2005: Video database Project was started
- 2006: Trial use with several NSF
- 2007: Public Announce of SMART-system
- 2008: Used for Beijing Olympic
- 2009: New SMART 2.0 project was started
- 2010: Used for Vancouver Winter Olympic
- 2011: SMART 1.5 was released

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Who archives the Content?

- JISS provides the system
- Federation puts videos

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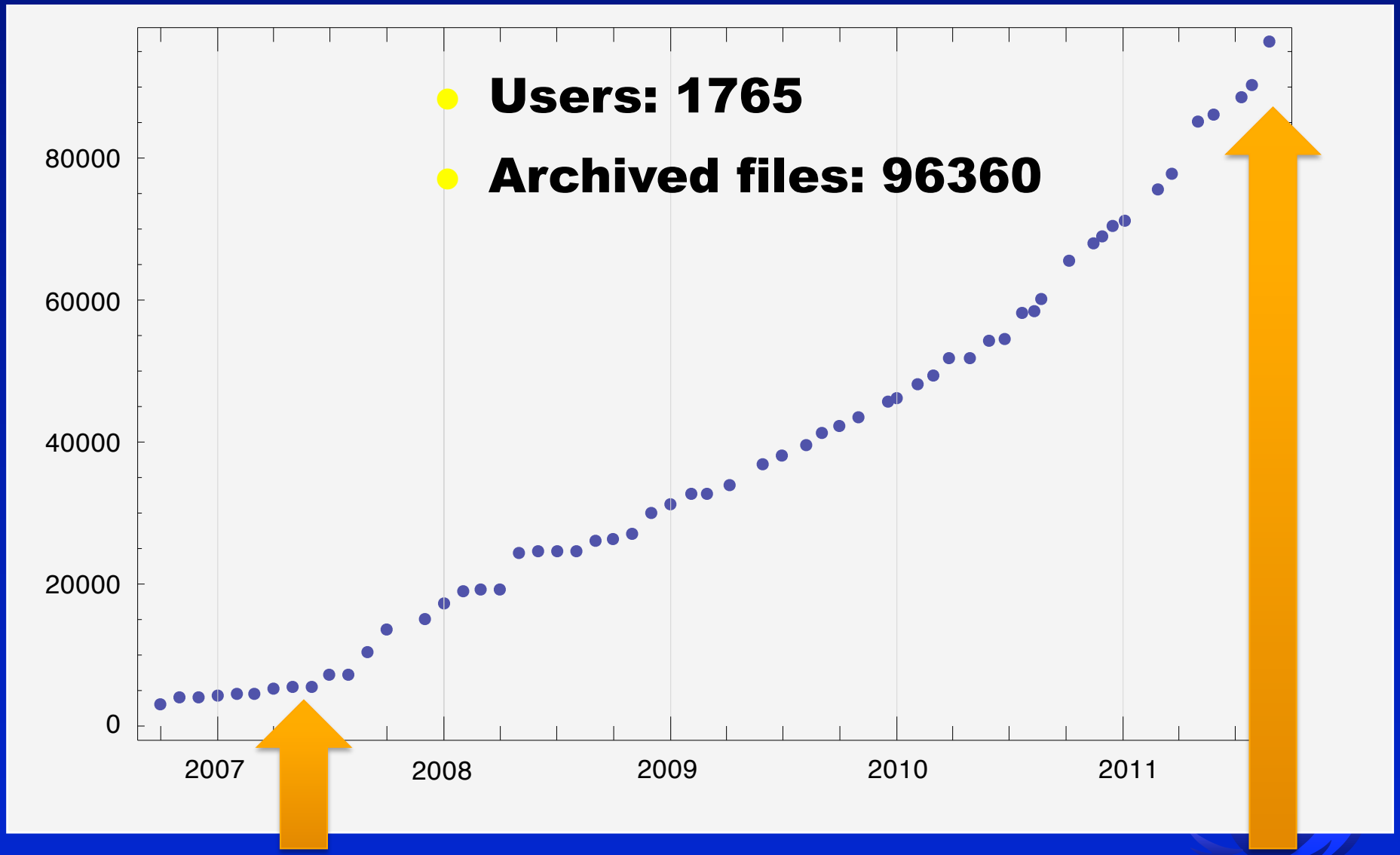
The slide I used for the last Forum in Beijing

2007.3.31

Sports	Movie
Judo	1312
Synchronised Swimming	2140
Mogul	625
Volleyball	159
Aerial	43
Table Tennis	86
Training	134
Tokyo Olympic	30
Sapporo Winter Olympic	7
Total	4536

How SMART grows?



The last Forum

This ASPC Forum

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Customers of SMART-system

Sport	Archived Files	Registered Users
Judo	24732	101
Artistic Gymnastics	11426	42
Speed Skate	10960	274
Synchronised Swimming	9056	102
Moguls	7497	64
Canoe	3687	38
Wrestling	1003	28
…	…	…
Total	96360	1765

SMART-system is used

- Archiving world class competitions
- Giving quick feedback at the competition
- Recording daily training

A topic on Judo:

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This Log tells one judo club used SMART extensively just before Beijing Olympic.

6月のログ	2	3	4	5	11	12	14	18	19	20	21	23	24	25	26	27	30	合計
三井住友	0	44	197	0	0	9	0	0	402	524	634	213	403	727	136	14	285	3588
SUGABE Shinya	0	0	0	0	0	0	0	0	0	0	0	0	0	118	0	0	0	118
福井 友子	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86
YAMAMOTO Yusuke	22	0	2	2	0	0	16	0	0	0	32	0	0	0	0	0	0	74
KANAMARU Yusuke	0	0	0	0	0	0	0	0	0	0	0	0	9	0	33	0	0	42
SATO Shinichiro	0	0	4	14	0	0	0	6	0	0	0	0	0	0	0	0	0	24
NAKAMURA Isamu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12
平岡 麻美	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8
田松本 愛	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2

The club's top player: Ms. Ueno explains how they use SMART.

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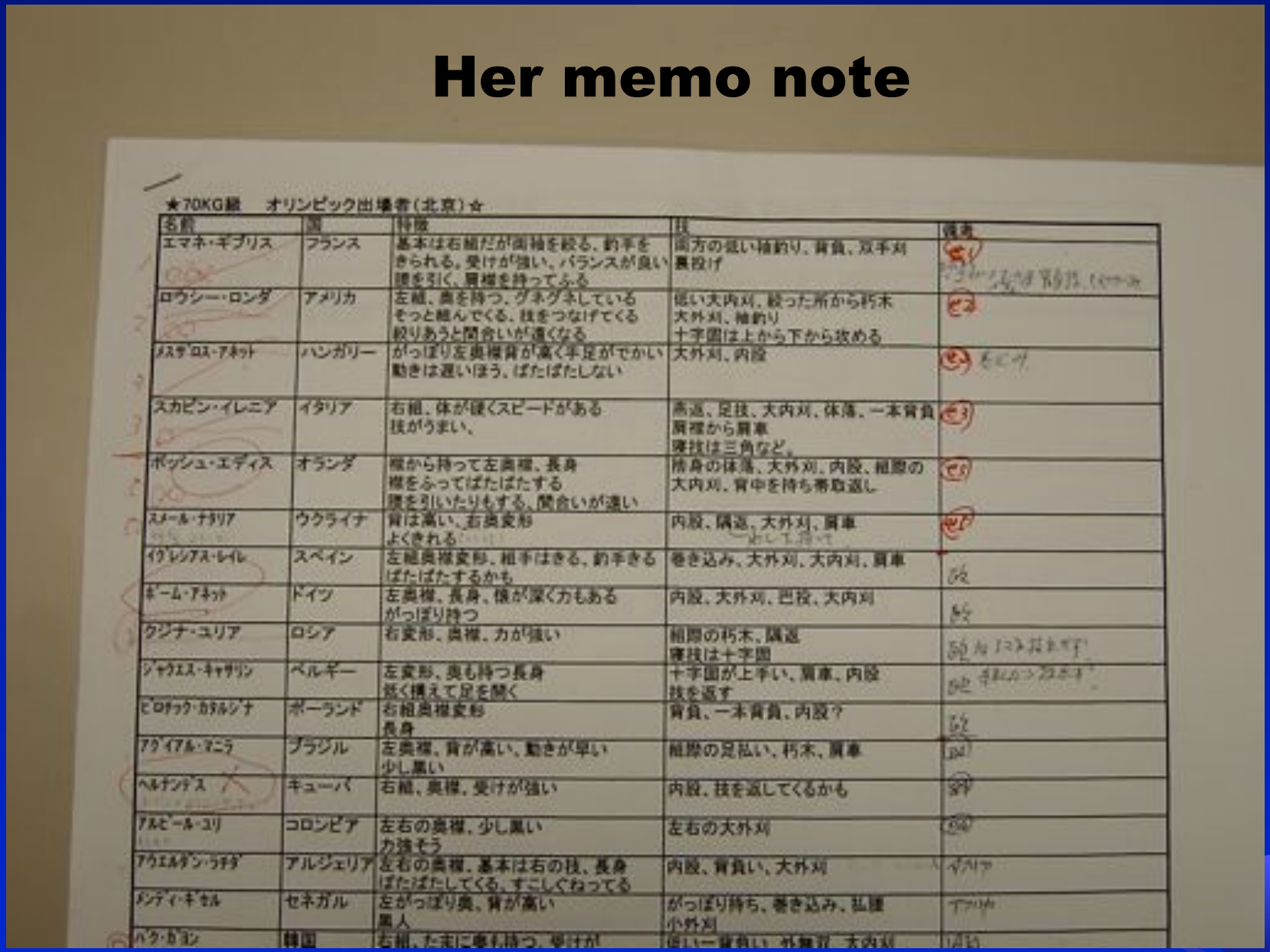
Her memo note



★70KG級　オリンピック出場者（北京）☆

名前	国	特徴	技	備考
エマネ・ギブリス	フランス	基本は右組だが両袖を絞る、釣手をきられる。受けが強い、バランスが良い 頭を引く、肩帯を持ってふる	両方の袖釣り、背負、双手刈 裏投げ	①
ロウシー・ロンダ	アメリカ	左組、奥を持つ、グネグネしている そっと組んでくる、技をつなげてくる 絞りあうと間合いが遠くなる	低い大内刈、絞った所から朽木 大外刈、袖釣り 十字固は上から下から攻める	②
メスダ・ロス・アネット	ハンガリー	がっぱり左奥襟背が高く手足がでかい 動きは遅いほう、ばたばたしない	大外刈、内股	③
スカピン・イレニア	イタリア	右組、体が硬くスピードがある 技がうまい、	巻返、足技、大内刈、体落、一本背負 肩帯から肩車 寝技は三角など。	④
ボッシュ・エディス	オランダ	襟から持って左奥襟、長身 襟をふってばたばたする 頭を引いたりもする、間合いが遠い	体身の体落、大外刈、内股、相原の 大内刈、背中を持ち巻取返し	⑤
スメール・ナタリア	ウクライナ	背は高い、右奥変形 よくきれる	内股、隅返、大外刈、肩車	⑥
イグレシアス・レイレ	スペイン	左組奥襟変形、組手はきる、釣手きる ばたばたするかも	巻き込み、大外刈、大内刈、肩車	⑦
ボーム・アネット	ドイツ	左奥襟、長身、様が深く力もある がっぱり持つ	内股、大外刈、芭投、大内刈	⑧
クジナ・ユリア	ロシア	右変形、奥襟、力が強い	相原の朽木、隅返 寝技は十字固	⑨
ジャウエス・キャサリン	ベルギー	左変形、奥も持つ長身 低く構えて足を開く	十字固が上手い、肩車、内股 技を返す	⑩
ピロチック・カタルジナ	ポーランド	右組奥襟変形 長身	背負、一本背負、内股？	⑪
アグイアル・マニラ	ブラジル	左奥襟、背が高い、動きが早い 少し黒い	相原の足払い、朽木、肩車	⑫
ヘルナンデス	キューバ	右組、奥襟、受けが強い	内股、技を返してくるかも	⑬
アルビール・ユリ	コロンビア	左右の奥襟、少し黒い 力強そう	左右の大外刈	⑭
アウエルダン・ラチダ	アルジェリア	左右の奥襟、基本は右の技、長身 ばたばたしてくる、すこしぐねってる	内股、背負い、大外刈	⑮
メンディ・キセル	セネガル	左がっぱり奥、背が高い 黒人	がっぱり持ち、巻き込み、払腰 小外刈	⑯
パク・カヨン	韓国	右組、左末に奥も持つ、受けが	速い一本背負い、外無双、大内刈	⑰

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She uses SMART for

- Checking all her rival's video
  - List up all their techniques
  - Train with her partner to overcome rival's techniques

She said
"I know how to react to the opponent because of the simulation training."

Her coach told

- Video is very useful when athlete watch it with purposes.

Synchronized Swimming:

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SMART-system was started from the video support for Synchronized Swimming

- 2002 Japan Open (Use a commercial soft)
- 2003 Japan Open (Use the commercial soft)
- 2004 Japan Open (Use the commercial soft)
- 2004 World Grandprix (modify the commercial soft)
- 2005 Japan Open (modify the commercial soft)
- 2006 Japan Open (Start using SMART-system)
- 2006 FINA World-Cup (SMART-system)
- 2007 Japan Open (SMART-system)
- 2008 Japan Open (SMART-system with the Internet)
- 2009 Japan Open (SMART-system with HD video)
- 2010 Japan Open (SMART-system with TWINS CAM)
- 2011 Japan Open was Cancelled

On a video feedback booth

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On a video feedback booth

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On a video feedback booth

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TWINS CAM Project with NHK

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TWINS CAM: an experimental cameras by NHK

TWINS CAM has two remote cameras

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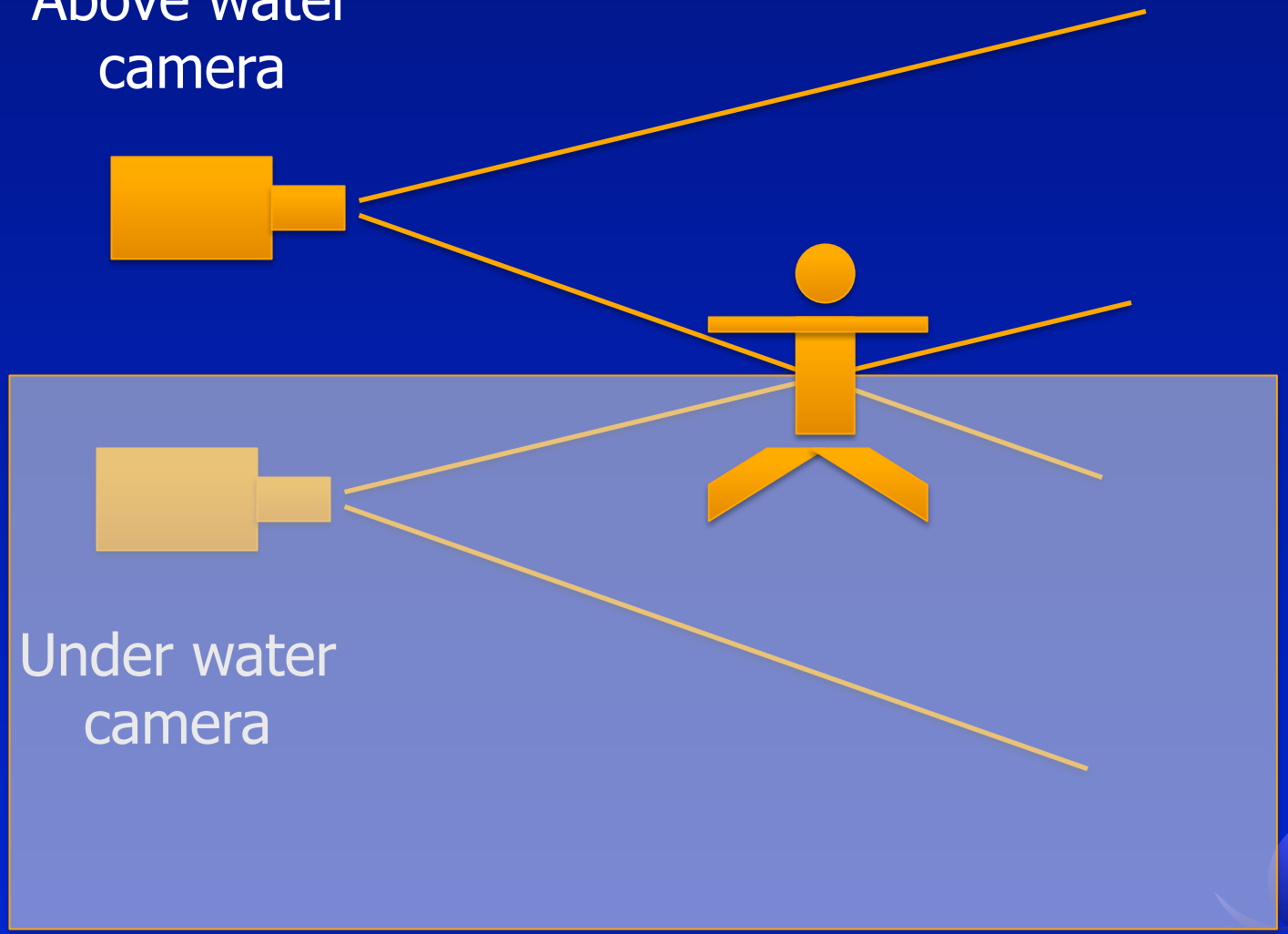
Concept of TWINS CAM



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Combine two views

Above water camera

Under water camera

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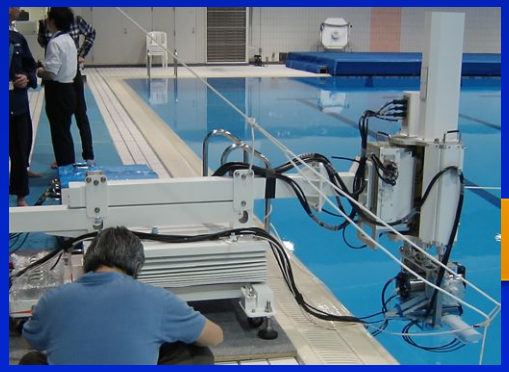
JISS
Underwater
camera

JISS
Above water
camera

SMART
system

NHK
TWINS CAM
system



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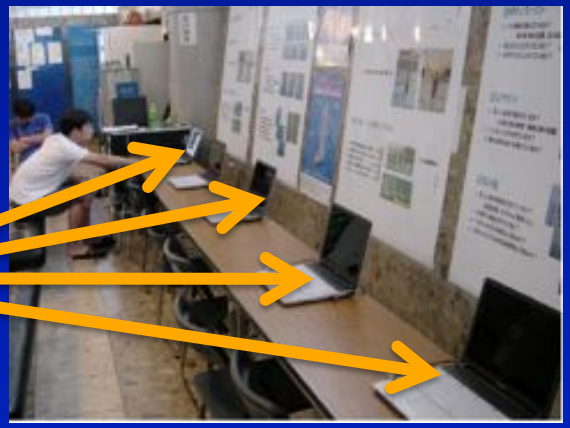
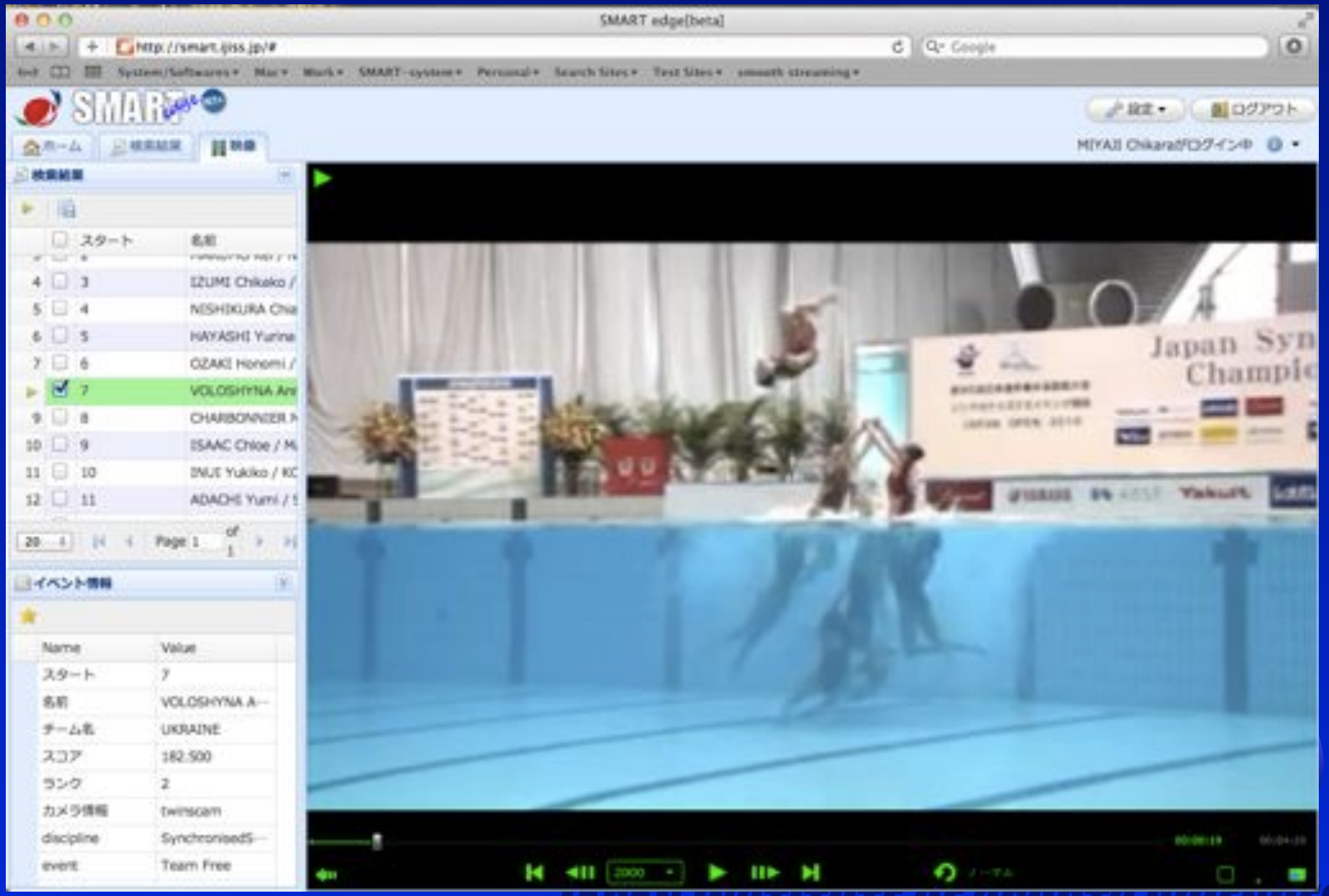
Service to Athletes just after their performance

SMART system



PCs

All TWINS CAM videos are on SMART



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TWINS CAM will
appear on
London Olympic TV

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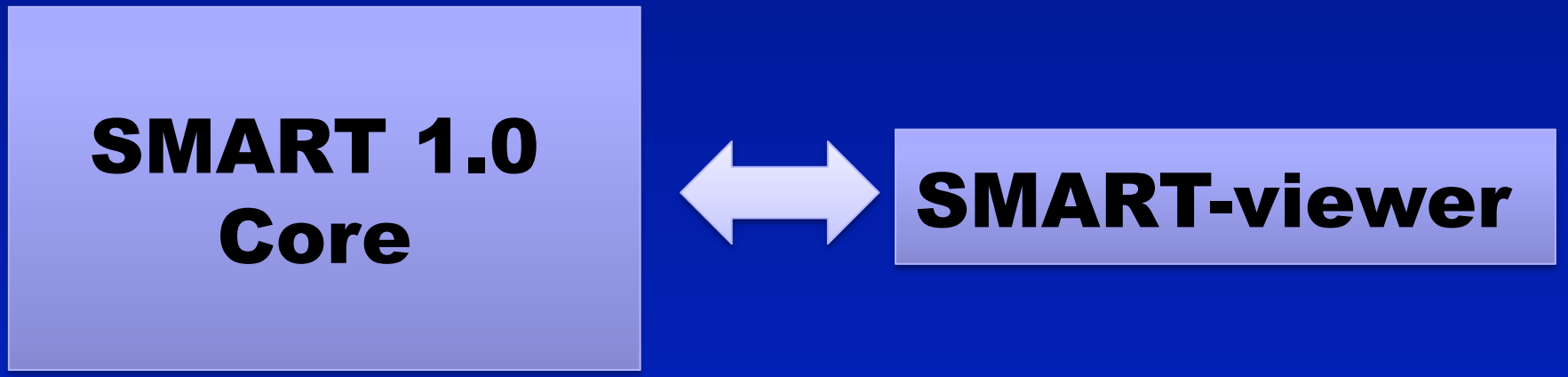
How SMART is managed and developed?

- We have SMART management team
  - 3 engineers
  - 1 manager from a sports federation
- We have projects for new development
  - Direct video uploading project
  - SMART 1.5 project
  - SMART 2.0 project
- SMART on HKSI project

SMART 1.0



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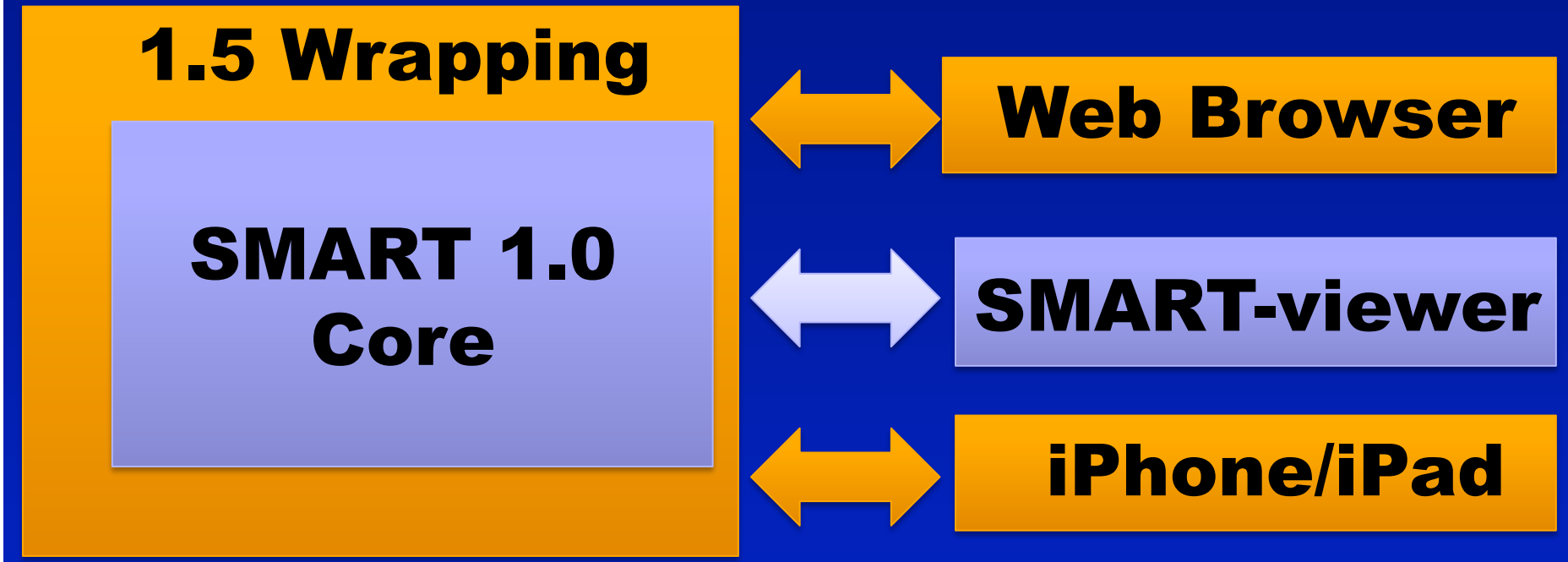
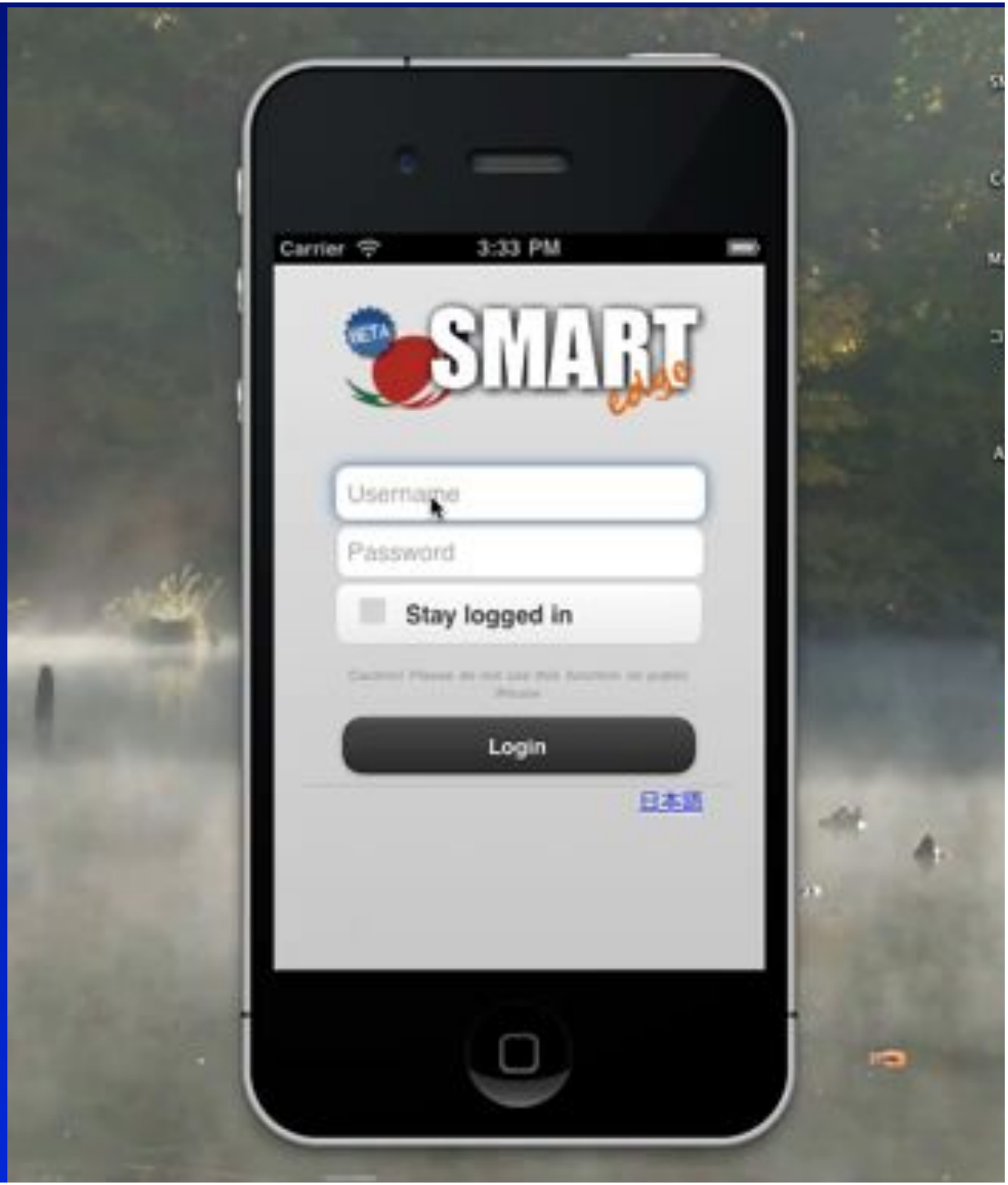
SMART 1.5


1.5 Wrapping
SMART 1.0
Core
Web Browser
SMART-viewer
iPhone/iPad

SMART 1.5 on iPhone



SMART 1.5 on iPad

Now Judo Federation uses 40 iPads for their top players.

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SMART 2.0 Features

- Advanced Research Project for new SMART
- SMART 2.0 has
  - New video browsing capabilities
  - New server construction
  - New mechanism for synchronizing video with web page

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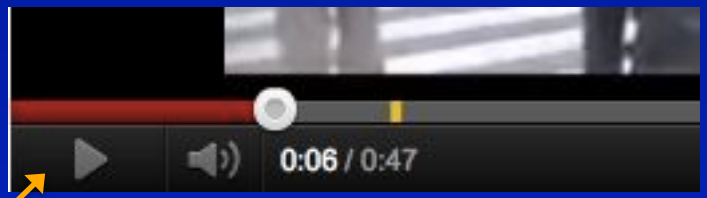
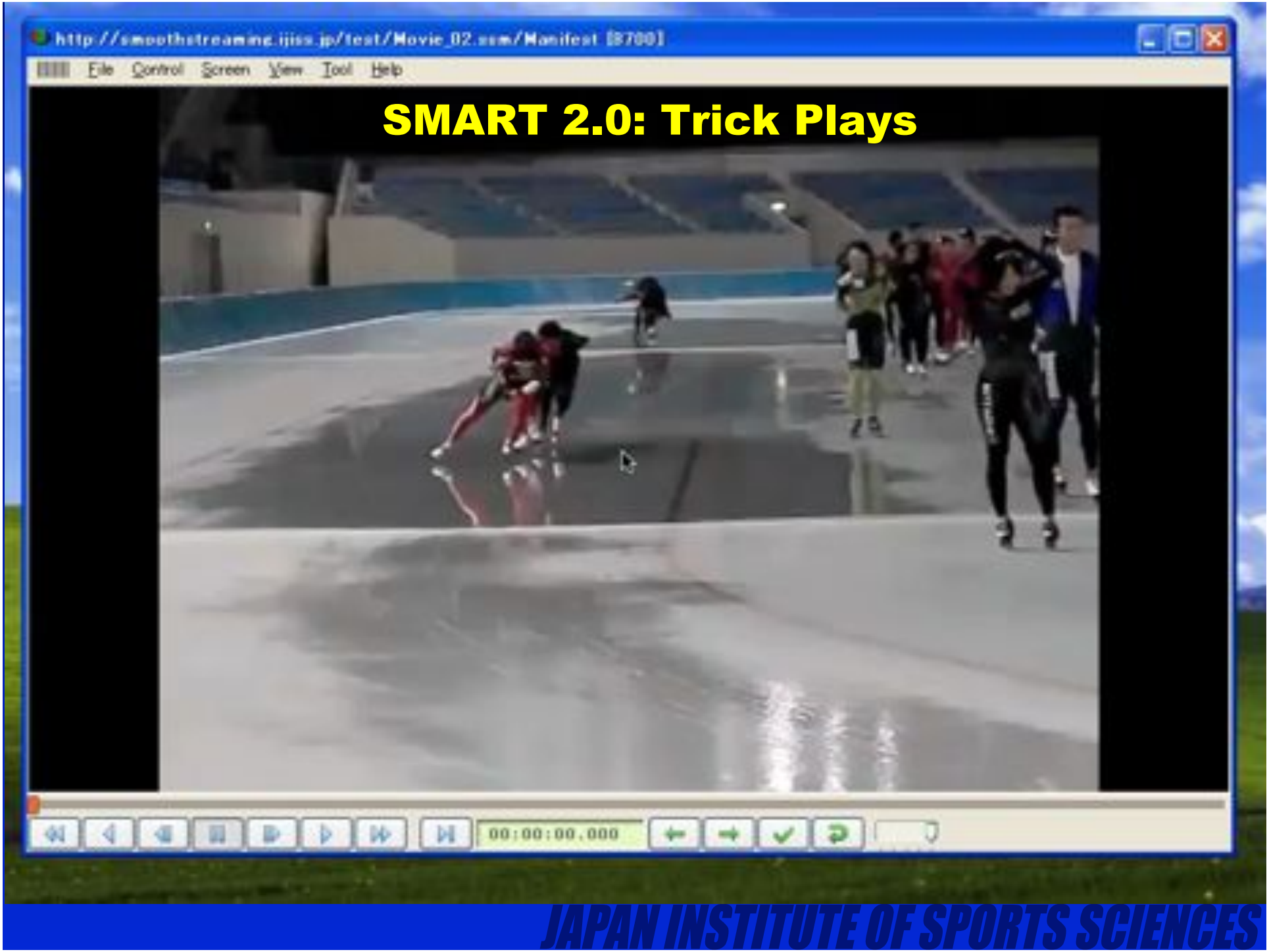
Current video browsing (like YouTube) is limited



– only play and pause


http://smoothstreaming.ijiss.jp/test/Movie_02.ism/Manifest [8700]
File Control Screen View Tool Help
SMART 2.0: Trick Plays
00:00:00.000
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http://smoothstreaming.iiis.jp/test/multicameras.ism/Manifest [60042]
File Control Screen View Tool Help
SMART 2.0: Special browsing
Like “MATRIX”
1 2 3 4 5 6 7 8 9 10
00:00:00.000

Where SMART goes?

- SMART will be an Open Source

- Share system with other Sports Institute
  - A project with Hong Kong Sports Institute
- SMART will be the base of other video applications
  - Motion analysis tool, tactical analysis tool etc.

Where sports video archives goes?

Each Institute or Sport foundation archives world class competitions

Share videos with several Institutes and Federations

- Reduce cost
- No secret on videos

IF will organize world class competition videos

- National Sports Institutes will help archiving

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video archives of world class competitions will be

- Archives all matches and events.
- Anybody can access these archives.
- Archives should be more than 10 to 20 years span.

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Summaries:

- Video support requires integrated solution such as camera, archiving, and browsing.
- Each Sport has different needs on video.
- Technology can contribute for better support.
- Now is the start to archive sports movements.

Thank you

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