

**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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31th, August, 2011, INSEP, Paris**



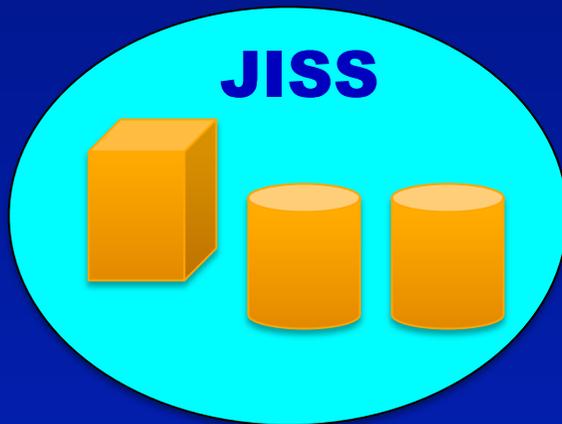
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Why I created a video database?

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



SMART-system is a



**Video database
For Sports**

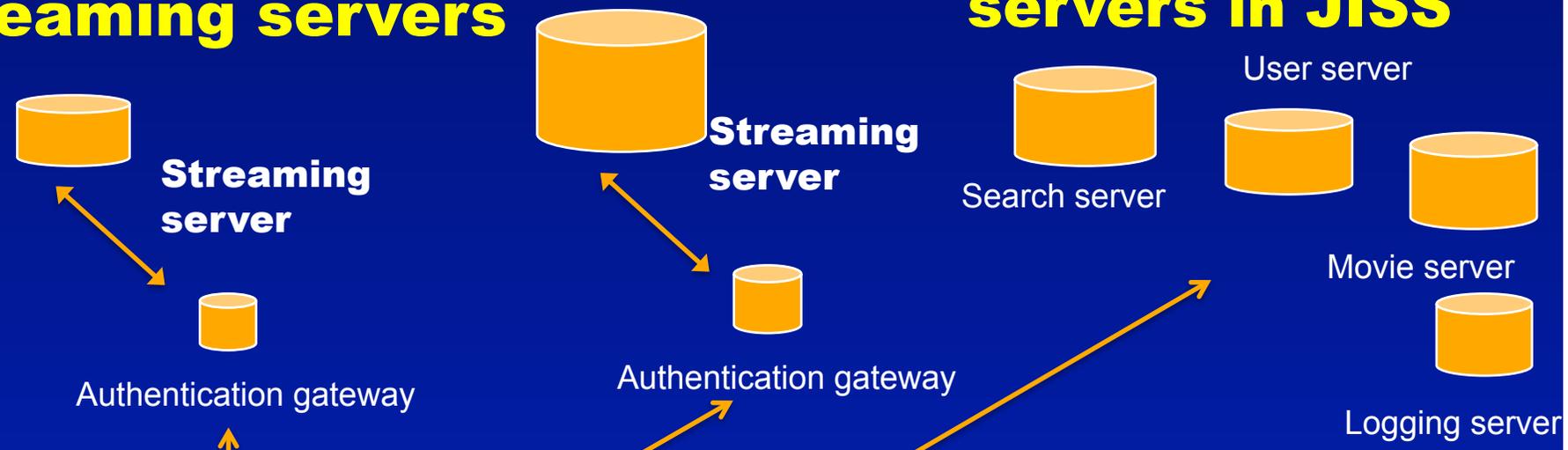
Streaming



- Sports Oriented Viewing**
- Easy searching method**

Distributed Streaming servers

Metadata servers in JISS



The Internet

| 名前 | チーム名 | 大会名 | 種目 | カテゴリ |
|---|---------------|----------------------------|------|--------------|
| ABEL Brooke / CLUP Janet / HOOVER Kate / ZONES Chris... | United States | Olympic Games Beijing 2008 | Team | Free Routine |
| AMBERGER Elise / BENTLEY Coral / BONNELL Sarah / ... | Australia | Olympic Games Beijing 2008 | Team | Free Routine |
| ABUALSLEM Reem / ANDUSTATIAN Azza / BAKRHA Ha... | Egypt | Olympic Games Beijing 2008 | Team | Free Routine |
| BOKUREAU GAGNON Marie-Pier / DUBUC Jessica / GAGN... | Canada | Olympic Games Beijing 2008 | Team | Free Routine |
| GUZBERG / SANG Tingting / SANG Wenwen / LIU / LIU... | China | Olympic Games Beijing 2008 | Team | Free Routine |
| KOJI Hi / HANADA Satsy / KAWACHIMA Naoko / KOBAY... | Japan | Olympic Games Beijing 2008 | Team | Free Routine |
| CABELLO Alba Maria / CORRAL Raquel / FUENTES And... | Spain | Olympic Games Beijing 2008 | Team | Free Routine |
| DAVIDOVA Anastasia / BRAMICHINA Anastasia / SPONDO... | Russian Fed. | Olympic Games Beijing 2008 | Team | Free Routine |

**Client:
SMART-viewer**



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**



Who archives the Content?

- JISS provides the system
- Federation puts videos

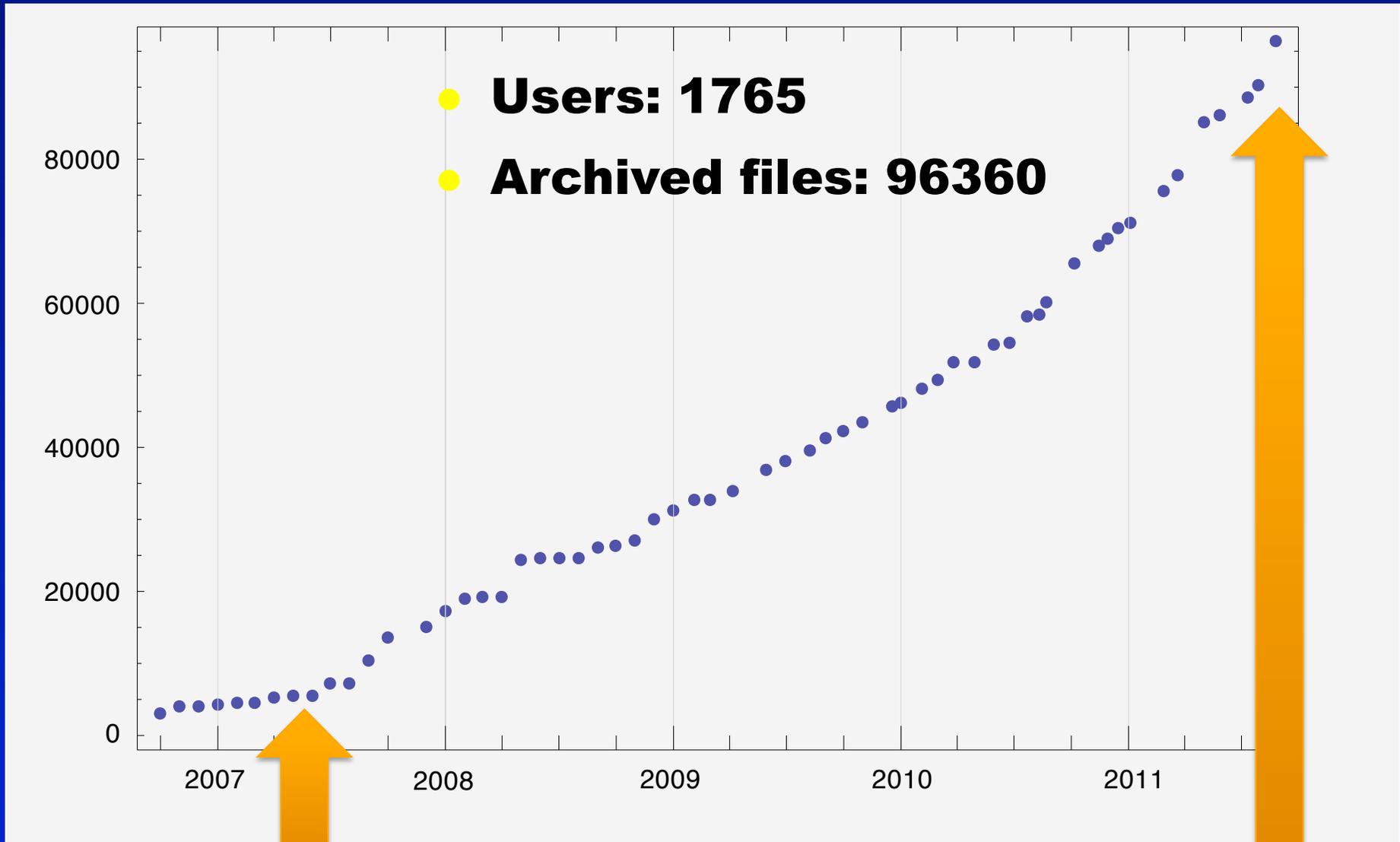


The slide I used for the last Forum in Beijing

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

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.

| 名前 | 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 | 0 | 0 | 0 | 402 | 524 | 634 | 213 | 403 | 727 | 136 | 14 | 285 | 3588 |
| SCSABE Shinya | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 218 | 0 | 0 | 0 | 218 |
| 堀江 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 真実 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 |
| 田中 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.



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 腰を引く、肩幅を持ってふる | 両方の低い袖釣り、背負、両手対 裏投げ | ① フランスの選手は、腕が長い |
| 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 ぞっと細んでくる、技をつなげてくる 絞りと奥との間合いが遠くなる | 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絞める | ② |
| マサロス・アネット | ハンガリー | がっばり左奥腰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 オランダ |
| 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、 | 燕返、足技、大内刈、体落、一本背負 肩幅から肩車 寝技は三角など | ④ |
| ポッシュ・エディス | オランダ | 腰から持って左奥腰、長身 腰をふってばたばたする 腰を引いたりもする、間合いが遠い | 積身の体落、大外刈、内股、組際の 大内刈、背中を持ち帯取返し | ⑤ |
| スモール・ナリア | 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 おいて、おいて | ⑥ |
| イリシヤス・レイレ | スペイン | 左組奥腰変形、相手はきる、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 | 左奥腰、長身、横が深く力もある がっばり持つ | 内股、大外刈、巴投、大内刈 | ⑧ |
| クジナ・ユリア | ロシア | 右変形、奥腰、力が強い | 組際の朽木、隅返 寝技は十字固 | ⑨ ロシアの選手は、腕が長い |
| ジャクス・キャザリン | ベルギー | 左変形、奥も持つ長身 長く構えて足を開く | 十字固が上手い、肩車、内股 技を返す | ⑩ ベルギーの選手は、腕が長い |
| ピロツク・カワシタ | ポーランド | 右組奥腰変形 長身 | 背負、一本背負、内股 | ⑪ |
| アライム・マコウ | ブラジル | 左奥腰、背が高い、動きが早い 少し黒い | 組際の足払い、朽木、肩車 | ⑫ |
| ヘルナンデス | キューバ | 右組、奥腰、受けが強い | 内股、技を返してくるかも | ⑬ |
| アズビル・ユリ | コロンビア | 左右の奥腰、少し黒い 力強そう | 左右の大外刈 | ⑭ |
| アケルダン・ラザ | アルジェリア | 左右の奥腰、基本は右の技、長身 ばたばたしてくる、すこしくねってる | 内股、背負い、大外刈 | ⑮ アルジェリア |
| メンディ・キセル | セネガル | 左がっばり奥、背が高い 黒人 | がっばり持ち、巻き込み、私腰 小外刈 | ⑯ アフリカ |
| ハラ・ジョン | 韓国 | 右組、たまに奥も持つ、受けが | 低い一本背負い、お無言、大内刈 | ⑰ |

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



On a video feedback booth



On a video feedback booth



TWINS CAM Project with NHK



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TWINS CAM: an experimental cameras by NHK

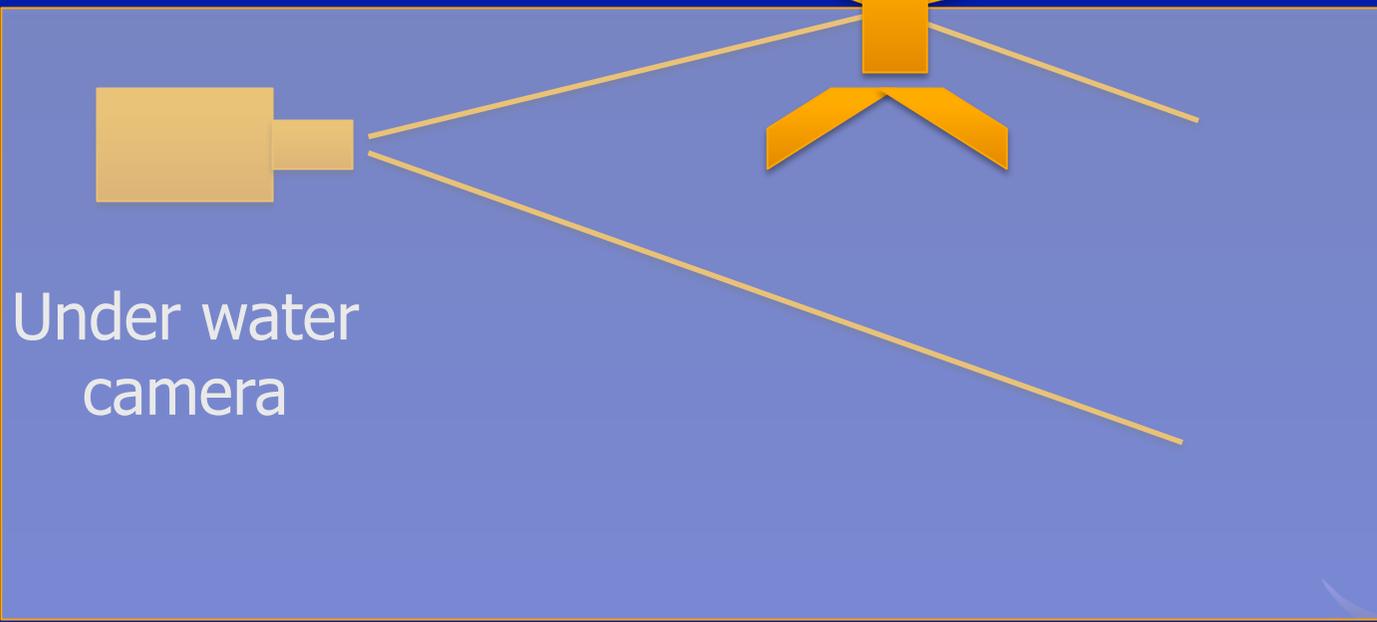


TWINS CAM has two remote cameras



Concept of TWINS CAM

Above water
camera



Under water
camera



Combine two views

Above
water
camera



Under
water
camera



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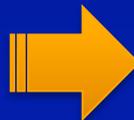
JISS
Underwater
camera



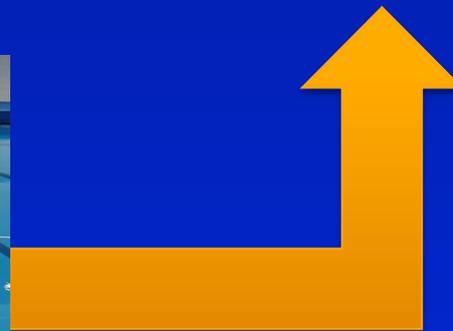
JISS
Above water
camera



NHK
TWINS CAM
system



SMART
system



Service to Athletes just after their performance



SMART
system

PCs



All TWINS CAM videos are on SMART

The screenshot shows a web browser window with the URL <http://smart.jiss.jp/#>. The page features the SMART logo and navigation links. A video player is displaying a synchronized swimming performance. To the left of the video is a results table with the following data:

| 順位 | 名前 | |
|------|----|------------------|
| スタート | 名前 | |
| 4 | 3 | IZUMI Chikako / |
| 5 | 4 | NESHIKURA Chi |
| 6 | 5 | KAYASHI Yuzna |
| 7 | 6 | OZAKI Honomi / |
| 7 | 7 | VOLOSHYNA An |
| 9 | 8 | CHARBONNIER P |
| 10 | 9 | ISAAC Choe / M |
| 11 | 10 | SNUE Yukiko / KC |
| 12 | 11 | ADACHI Yumi / S |

Below the table is an 'イベント情報' (Event Information) section with the following details:

| Name | Value |
|------------|----------------|
| スタート | 7 |
| 名前 | VOLOSHYNA A- |
| チーム名 | UKRAINE |
| スコア | 182.500 |
| ランク | 2 |
| カメラ情報 | twinscam |
| discipline | SynchronisedS- |
| event | Team Free |



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**TWINS CAM will
appear on
London Olympic TV**



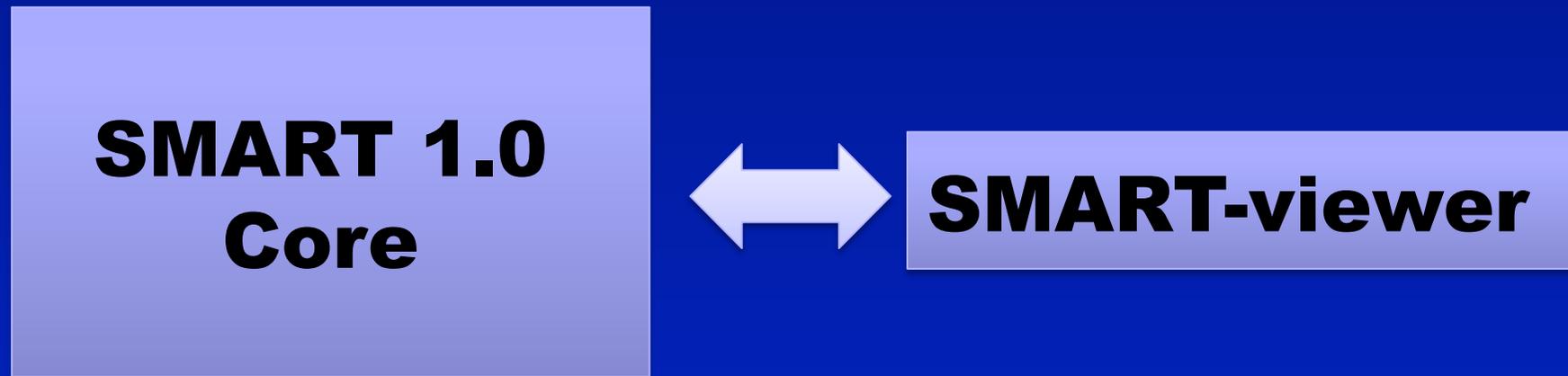
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How SMART is managed and developed?

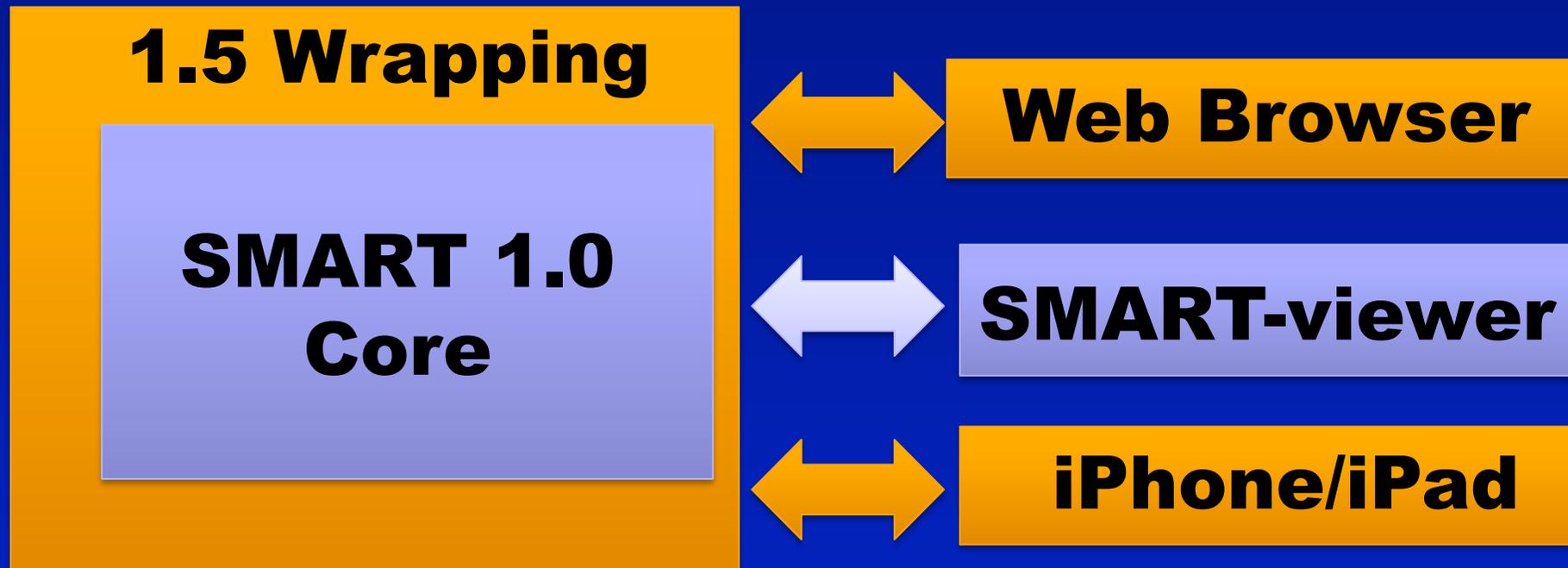
- We have SMART management team**
 - 3 engineers**
 - 1 manager from a sports federation**
- We have projects for new development**
 - Direct video uploading project**
 - SMART 1.5 project**
 - SMART 2.0 project**
- SMART on HKSI project**



SMART 1.0



SMART 1.5



SMART 1.5 on iPhone



SMART 1.5 on iPad

The screenshot displays the SMART 1.5 application interface on an iPad. At the top, the status bar shows 'Carrier', signal strength, '7:10 PM', 'SMART egds', and '100%' battery. The browser address bar contains 'smart.ijss.jp/#sceneDetail' and a search bar with 'Google'. Below the browser bar, a 'Back' button and 'Search result' are visible, along with a page indicator '7/188'. The main content area is split into two columns. The left column is a list of search results, with the 7th result, '7. RINER Teddy', highlighted in blue. The right column features a video player showing a judo match between a white gi fighter and a blue gi fighter on a yellow mat. Below the video player, there is a 'Scene details' section with a 'Show URL' button and a table of match information.

| Scene details | |
|---------------|--------------|
| 選手名 | RINER Teddy |
| 国名 | FRA |
| 選手名 | RAJABI Ehsan |

At the bottom of the screen, there are 'Prev' and 'Next' navigation buttons, and a page indicator '1 - 20 / 188'.

**Now Judo Federation
uses 40 iPads for
their top players.**



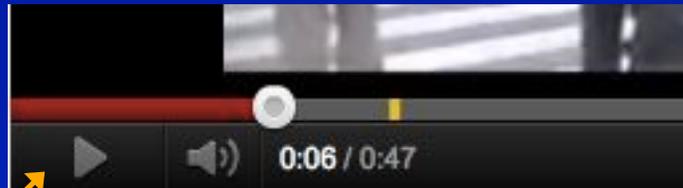
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SMART 2.0 Features

- **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**



Current video browsing (like YouTube) is limited



– only play and pause

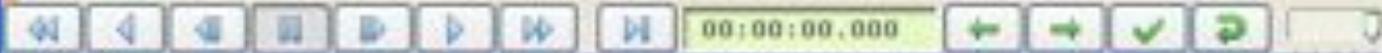


http://smoothstreaming.ijiss.jp/test/Movie_02.asx/Manifest [8700]



File Control Screen View Tool Help

SMART 2.0: Trick Plays





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



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.**



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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