Institution:	Goldsmiths, University of London
Unit of Assessment:	11: Computer Science and Informatics
Title of case study:	Winkball: connecting people through video

1. Summary of the impact (indicative maximum 100 words)

This study describes impact from James Ohene-Djan's research on personalisation, assistive technologies for the deaf, and web-based video. The research led to two spin-out companies:

(i) Viewtalk was started by Ohene-Djan in 2008 in partnership with Deafax, a charity dedicated to access for people with impaired hearing. Viewtalk developed video messaging specifically tailored to the needs of the UK's nine million deaf and hard-of-hearing people.

(ii) WinkBall was developed in partnership with a privately-owned UK news organisation (Correspondent Corporation). Winkball provided a system that enabled users to post video content for specific audiences and purposes. At its peak it employed 300 reporters to supply dedicated content, and generated a user community of 150,000 active content-generators and three million video watchers.

2. Underpinning research (indicative maximum 500 words)

James Ohene-Djan is a senior lecturer in the Computing Department at Goldsmiths, having been appointed originally as lecturer in January 1999. He has been employed here continuously except for a short break in his contract from May 2000 to January 2001.

The research started with Ohene-Djan's PhD (completed in 2000 at Goldsmiths, supervised by Alvaro Fernandes, now at Manchester) on usability of web-based systems; this is summarised in [1]. The PhD provided, we believe, the first formal specification and definition framework of a complete set of functions for personalisable, adaptive hyperlink-based user interaction with hypermedia. Ohene-Djan defined an architecture, data model, manipulation language and set of interaction modes that were later to provide the framework for the Viewtalk and Winkball systems.

Viewtalk: Ohene-Djan developed his research, investigating how to enhance social communication for people with hearing impairments. His analysis of their needs led to the development of a video-based communication system (Viewtalk) that could be used interactively in educational contexts to enhance students' learning. Viewtalk was equipped with features that facilitated the use of sign language in videos; it also utilised a range of social media technologies such as instant messaging and 'chat' systems [2]. It is an online video sharing platform, requiring no specialist software or hardware, enabling users to record and post video blogs, conduct video conversations, and participate in sign-language based role-plays. The site hosts videos by dedicated reporters on sport, current affairs, education, arts, and the learning of British Sign Language. Developing Viewtalk involved working collaboratively with the deaf advocacy charity Deafax and with members of the deaf community to design the interfaces and functionality, iteratively, through participatory design methods [3]. This research, for example, led to insights on how to incorporate affective information with no sound and digital representations of sign language [4].

Transport for London approached Ohene-Djan and Viewtalk to find out how video could be used to communicate road safety information to deaf people, especially children. Ohene-Djan, working in collaboration with the police and deaf advocacy groups, developed a video information system for Transport for London; this used Viewtalk technology and is still a part of the Viewtalk system [5].

WinkBall: The HCI research undertaken in relation to Viewtalk, and also in the underlying software architecture of that system, formed the foundation for the development of a larger system for "different-time, different-place" video communication for more general audiences: Winkball [6]. This built on the technologies used in Viewtalk and provided additional features to enable the formation of online communities using private video walls and blogs. It allows controlled multi-level access to video.

The predominant new research problems that needed to be solved to move from Viewtalk to Winkball concerned scalability. The robustness and scalability of the system was tested and developed through a series of real-world deployments. The most extensive of which was during the 2010 FIFA World Cup in South Africa, when over 100,000 real-world WinkBall users simultaneously accessed over 80,000 videos which were recorded and uploaded during the tournament over a 40 day period. Users from 40 different countries help test the robustness of the system through multi-user video message sending, real-time video blogging, and posting on community video walls.

Winkball was able to meet that demand (and subsequently much greater demand: it now stores over 3 million videos) through Ohene-Djan's development of (i) a number of innovations in software architecture for web-based video systems and (ii) a new multi-processing video transcoding system that encodes video from a range of sources and formats. The architecture details are not published since they are commercially confidential, but they are the subject of two international patents (see section 5, reference [1]).

3. References to the research (indicative maximum of six references)

The international quality of the research is evidenced through the publication of results in rigorous peer-reviewed journals ([1], [2] and [5]) and IEEE conferences ([2], [3], and [6]). All outputs are available in hard copy on request from Goldsmiths Research Office.

1. Ohene-Djan J and Fernandes A (2002) "Modelling Personalisable Hypermedia: The Goldsmiths Model." New Review of Hypermedia and Multimedia, 8, 99–137. ISSN 1361-4568. DOI: 10.1080/13614560208914738

2. Ohene-Djan J, Zimmer R, Gorle M, and Naqvi S (2003) "A personalisable electronic book for video-based sign language education." Educational Technology & Society, 6(4), 86–99. October 2003, IEEE Technical Committee on Learning Technology, IFETS. ISSN 1436-4522. DOI: 10.1.1.101.3089

3. Ohene-Djan J and Shipsey R (2008) "Principles for Inclusive Software Design of Learning Technologies". *ICALT '08: Proceedings of the 2008 Eighth IEEE International Conference on Advanced Learning Technologies*, 989-990. IEEE Computer Society, Washington, DC, USA; July 2008. ISBN:978-0-7695-3167-0; DOI: 10.1109/ICALT.2008.254

4. Naqvi S and Ohene-Djan J (2009) "Emotional Engineering of Digital Representations of Sign Languages – the Importance of Facial Detailing". Conference and Workshop on *Assistive Technologies for People with Vision and Hearing Impairments: Past Successes and Future Challenges*, 20–23 April 2009; Wroclaw, Poland [*Available on request]*

5. Hersh M, Ohene-Djan J, Naqvi S (2010) "Road safety and deaf people: the role of the police". *Journal of Prevention & Intervention in the Community* 38(4), themed issue on Community-Based Applications to Enhance Road Safety. DOI: 10.1080/10852352.2010.509023

6. Ohene-Djan J (2010) "Winkball for Schools: An Advanced Video Modelling Technology for Learning Visual and Oral Communication Skills". In *Proceedings of the 2010 10th IEEE International Conference on Advanced Learning Technologies (ICALT '10)*, 687-689. IEEE Computer Society, Washington DC, USA. ISBN: 978-1-4244-7144-7 DOI: 10.1109/ICALT.2010.193

4. Details of the impact (indicative maximum 750 words)

In 2011 Ohene-Djan spun Viewtalk off into a business, offering completely free access to members of the deaf and hearing-impaired community and commercial marketing services to companies interested in engaging with that community. Organisations that have used the Viewtalk service [2] include the London Zoo, John-Lewis Partnership, Heathrow Airport, and the Science Museum [2,6,8]. Since 2009 the deaf advocacy charity Deafax has promoted Viewtalk as a means of creating multi-media information resources. As well as providing media for the deaf and hearing-impaired

community [6], Viewtalk also provided employment for members of that community: at its height, Viewtalk had 20 employees, 13 of whom were deaf or hearing-impaired [5].

The benefits of Viewtalk have been recognised by experts in education, social cohesion, and social policy. This is evidenced in a set of video interviews incorporating sign language with the following people: Sabine Iqbal, UK Founder of Deaf Parenting [5]; Malcolm Bruce MP and Bob Russell MPs members of the All-Party Parliamentary Group on Deafness; Eva Fielding Jackson, trustee for the British Deaf Association; Paul Enales, Chief Executive Officer of the Anti-Bullying Alliance; Paul Simpson form the British Association of Teacher of the Deaf (BATOD); Tom Fenton, Chief Executive Officer of the Royal Association for Deaf People; Ines Sleeboom Van Raaij, President of the European Congress of Mental Health; Catherine Forry, Founder of Deaf Advocacy and Justice 4 Deaf People; Lord Michael Heseltine, former Deputy Prime Minister. Paul Simpson of the BATOD typifies responses to using the system: *"Viewtalk is a great example of a British university producing an assistive technology that really goes to the heart of what's needed for young deaf people today. It's innovative and uses the Internet to communicate which is essential."* [2]

Five secondary schools from across the UK participated in a pilot project, during the period October 2010 and July 2011, which enabled pupils to make videos on a range of school and community topics. Teachers reported positive effects on pupils' communication, teamwork, organisation, presentation, self-confidence, leadership and time management. Examples of children's work can be found on the ViewTalk webpages [2]. The Principal of Donaldson's College, Scotland's national educational centre for people with special hearing and communications needs, said: *"Viewtalk will offer … opportunity to deaf people for getting support and I am really delighted to be taking part in promoting that."* A second project, which trialled the use of Viewtalk in two special needs schools, received lottery funding of £10,000 in July 2011. The project had 32 student participants, 55 parent participants, 20 teachers and 5 volunteer psychologists. Measured outcomes identified that 90% of students had a positive experience of using the Viewtalk technology and 42 parent respondents stated that Viewtalk was the most advanced technology their child had used successfully. The Deputy Head of a Special School, Berkshire, Reading, stated that: *"the pilot project had measurable benefits in increasing their understanding of how technology can be used with Special Needs students".*

In evaluating the pilot, Dr Berry Billingsley, Associate Professor in Science Education and parent of a child with Autistic Spectrum Disorders (ASD), and Dr Cathy Tissot, Specialist in ASD, noted that the technical and communication skills of the pupils had increased and given everyone concerned more confidence to engage with video online communication for educational purposes. The project was successfully completed in April 2012 [7].

WinkBall was established as a company in 2009. It had a turnover of £2.5 million a year for 3 years, a staff of 60 full-time employees [8], 300 interim reporters (in the UK, the US, India and South Africa), and an active user group of 150,000. At the end of this 3-year period, the specified objectives of WinkBall had been achieved in terms of technical advances in video content creation and multi-user, large scale access. From July 2012, the WinkBall project was scaled back so that focus could be given to the development of new technologies for mobile video communication using the WinkBall infrastructure. This work is currently underway. From August 2009 to July 2012, 3 million videos were uploaded to WinkBall and there were over 30 million views [3].

A wide range of organisations have found WinkBall an effective part of their communications strategy and became paid clients [4]. Clients have included Visit Britain, Transport for London, Crossrail, London Development Agency, London Ambassadors, LOCOG, The Mayor's Office, the Greater London Authority, Sony Music, Sky Sports, William Hill, Zurich, Jeep, Daily Telegraph, Shell, Disney, Sky Bet, and The Sun. Innovative campaigns such as Transport for London's Barclays Cycle Hire Launch, the Olympic London Ambassador's Launch, Sony Music's Why Music Matters campaign and WinkBall's Faces for the Forces campaign led to WinkBall being nominated Finalists for several major industry awards, including the Marketing Week Engage Awards 2010, the Chartered Institute for Public Relations Awards 2011 and the PR Week Awards 2011 [4].

WinkBall ran several high-impact international campaigns [3]. For example, "Faces for the Forces" enabled the public to send a million video messages of support to the UK Armed Forces in Afghanistan was conducted annually between 2009 and 2011. Brigadier AT Davies MBE at HQ, Joint Forces [9] sent a letter of thanks to Winkball and the project was publically endorsed by David Cameron. In another example, 500 candidates in the 2010 UK general election used WinkBall to communicate with voters in the "Do You Know Who You're Voting For?" campaign from January 2010 to May 2010 [3]. Working in collaboration with the United Nations and the Hoping Foundation charity, WinkBall helped commemorate the 20th anniversary of the year of the Child and the 60th anniversary of the creation of UNRWA by using video technology to connect 500 United Nations schools in Palestine, Syria, Jordan and Lebanon, during the period June 2009 to August 2010, enabling 50,000 school children to record video messages expressing their hopes and dreams for the future in an online video yearbook [10].

In 2010, 80,000 videos were recorded that provided a unique insight into the hopes, dreams and events of the first African nation to host a World Cup. The impact was recognised at the highest level within South Africa, with the High Commissioner of South Africa, Dr Zola Skweyiya personally inviting Ohene-Djan to present the WinkBall video content and technology to all of London's African Ambassadors and High Commissioners who were invited to a reception at South Africa House on 23rd July 2010. Dr Zola Skweyiya stated that: "In a million years I can't describe what this tells you in five minutes about South Africa". Niall Wilkins, First Secretary Political, South African High Commission, stated that the WinkBall video archive and technology "truly captured the legacy of the 2010 FIFA World Cup", and was an important record for the South African nation. He stated that: "I am going to speak to a friend of mine in the Presidency about this". The WinkBall archive was donated to the University of Capetown and the South African Tourist Board [3].

5. Sources to corroborate the impact (indicative maximum of 10 references)

All the materials listed below are available on request, in hard or electronic format, from Goldsmiths' Research Office.

1. Patent for Video Communication System; Inventors: Duncan Barclay, James F. Ohene-Djan. Pub. No.: US 2012/0017254 A1, Pub. Date: Jan. 19, 2012. SPC Class: 725115, PCT No. PCTGB09/51343;

   Patent for Content Distribution System; Inventors: Duncan Barclay, James F. Ohene-Djan. Pub. No.: US 2012/0188331 A1, Pub. Date: Jul. 26, 2012. IPC8 Class: AH04N715FI, USPC Class: 348 1408, PCT No. /GB2010/05129.
2. Key website descriptions and URLs for Viewtalk and WinkBall are listed here.
3. The WinkBall project press archive contains detailed information on all print, online and video press.
4. WinkBall Industry Finalist Awards
5. Viewtalk: examples of educational work
6. The Viewtalk press archive
7. ACCT Through WinkBall & Viewtalk
8. Sales summary, list of staff and R&D Tax Relief Claim for Viewtalk and WinkBall are here
9. Faces for the Forces: video content and sample press coverage.
10. Press coverage for WinkBall UNRWA Schools project; examples include:
    - BBC Click, the BBC's flagship technology programme on BBC News 24, included a review of the WinkBall project by Kate Russell; first broadcast 06/11/09.
    - Sky News interviews Ohene-Djan about the WinkBall project nationwide campaign *Faces for the Forces*; first broadcast 05/11/09.
    - CNBC interviews Ohene-Djan as the example of the future of the internet as part of its series *The Internet Turns 40*; first broadcast 29/10/09