

Institution: University of Bolton		
Unit of Assessment: Business and Management Studies C17		
Title of case study: Business Modeling and Management of Asset Based Development for the Digital Games Industry		
Period when the underpinning research was undertaken: 2014-2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Paul Hollins	Professor Cultural Research Development (IoM)	2003 to present
Dai Griffiths	Professor Educational Cybernetics	2008 to present
Paul Cowley	Researcher Institute of Management (IoM)	2015 to present
Denis Hyams-Ssekasi	Research Coordinator Institute of Management (IoM)	2015 to present
Li Yuan	Research Reader	2008 to 2018
Period when the claimed impact occurred: 2015-2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words)		
<p>The Institute of Management (IoM) led the research in the Realising an Applied Gaming Ecosystem (RAGE) European H2020 project; investigating the structures, business models, value chains and component-based production processes deployed by the applied digital games industry. Significant impact was achieved as the new component-based production processes and models developed by the project are now embedded in the practice of commercial European games developers and the games containing the assets are accessed by learners located in in France, Portugal, Netherlands, Italy, UK, Spain and Germany. The European Commission selected the project for the prestigious EU 'Innovation impact' award in 2018.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>The global demand for games designed with a purpose other than leisure or entertainment referred to as applied games is expected to increase over the coming years. The applied games industry in Europe is fragmented and competitively disadvantaged in relation to the more established industries of the United States and Asia. The RAGE project investigated whether the industry could learn form and adopt production and business processes and methodologies deployed by their successful leisure industry counterparts to achieve a competitive advantage. The IoM led the project with other partners contributing technical and pedagogic expertise, commercial exploitation and administration. This research sought to identify good practice in the development processes and business models of the more established leisure industry that could be deployed to increase efficiency and the profitability of developers whilst improving the quality of their products. This involved extensive research in to the process and business models of the</p>		

more established leisure games industry through stakeholder consultation and a comparative analysis of the established and emergent business models and value chains of both industries. The principal aim was to develop new business and process models that could serve to underpin the potential growth in demand for applied games.

A significant barrier to international competitiveness identified was the cost of production related to the efficacy of development processes and specifically the high cost of development. In the leisure industry the use of outsourced middleware and software components was commonplace. Businesses such as Unity served demand by providing a market place of components or assets that were affordable and widely used by the industry. However, whilst these methodologies and business models were well established in the leisure industry in the applied industry they were not. These methodologies and models had not been validated and were largely untested in the applied industry; where complex pedagogic features and functions were identified and highlighted as essential ingredients of applied games. The RAGE project undertook to establish an equivalent asset-based market place for the applied industry in Europe. This involved the development and testing of reusable, interoperable, open source software assets by technical partners. The assets, process and business models were evaluated and tested and the provision of a platform to market these assets. The assets were made available to the European development industry with the aim of condensing the development time to market and several pilots were undertaken with the industry as a proof of concept. The assets were rigorously tested by the developers based in the UK, France, Germany and Holland. The efficacy of the processes assets and business models was further evaluated.

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

1. Cowley, P, Hyams Ssskasi, D. & Hollins, P. (2020) Triple Helix as a Tool for Knowledge Management, Transfer and Entrepreneurial Outcomes on a European Scale: A Case Study of the Rage Project. Eurasia Business Economics and Society Conference Istanbul 2020 <http://ebesweb.org/Conferences/32nd-EBES-Conference-Istanbul.aspx> (Accessed August 2020)
2. Cowley, P. Hyams Ssekasi, D. & Hollins, P. (2020) Stakeholder Perspectives on an EU project for applied games design. 'Edulearn' 2020 Spain https://iated.org/concrete3/paper_detail.php?paper_id=83198 (Accessed August 2020)
3. Gergiev., Bontchev, B., Boytchev, P., Stefanov, K., Westera, W., Nyamsuren, E., Bahreini, K., Prada, R., Hollins, P. (2017) "The RAGE Game Software Components Repository for Supporting Applied Game Development" International Journal of Serious Games Volume 4, Issue 3, September 2017 ISSN: 2384-8766
4. Santos,P., Romeiro,P., Nunes,F., Hollins,P., Riestra,R. (2016) "The Video Game Industry in Portugal" Extended Paper in "Revista de Ciências da Computação", ISBN 978-989-207148-0 http://vj2016.di.ubi.pt/Santos_VideoGameIndustry_1-10.pdf (Accessed April 2019)
5. Published RAGE Project Deliverables in Work Package 7 (WP7) providing detail of the aspects of the research undertaken All reports Accessed April 2019:

Hollins, P. Yuan. L, Santos,P, Becker,J. Riestra,R. (2016) 'Summary Report of Business Models' <https://research.ou.nl/en/publications/d71-summary-report-of-business-models>
6. Hollins, P., Wistera, W., Manero, B. (2015) 'Amplifying applied game development and uptake' European Computer Games Based Learning Conference (ECGBL) Published in proceedings 8th October 2015 https://www.researchgate.net/publication/282336538_Amplifying_applied_game_development_and_uptake (Accessed April 2019)

4. Details of the impact (indicative maximum 750 words)National and International Impact

As a result of the research; methodologies, production processes and business models developed as outputs within Work-package 7 of the RAGE project have been widely adopted by the key beneficiaries of the research, European based applied game development studios. These developers have enjoyed improved efficiencies in production, gained insight into their competitive market and identified potential growth opportunities in applied games. Six compelling international commercial case studies, supported by testimony, refer to the corroboration of Impact 3,4,5,6,7,8, are provided as supporting evidence of the impact of the project on their internal development processes and business efficiencies. These case studies testimonies include from the United Kingdom Playgen and Gameware, from France BIP Media and from Germany Nurogames. The adoption of processes and asset-based production methodologies and business models have resulted in achieving significant development cost savings in research, development and production by the businesses concerned thereby improving their global competitive advantage.

The impact of the project outputs has extended beyond that of beneficiaries to research and development activities supported by the EU involving major international corporations. One of the highest profile of projects utilising the RAGE outputs is the “Jenner” applied game <http://shura.shu.ac.uk/22448/>.

The game was produced in collaboration between Sheffield Hallam University, Steel Minions Developers and Sony Playstation as part of the REVEAL project. This Virtual Reality (VR) Game included a VR, simulation of the house of Georgian Scientist Dr Edward Jenner and was developed applying the asset-based development methodologies and the use of a several of RAGE components. The 2019 gamification award winning project The Breaking Educational Barriers with Contextualised, Pervasive and Gameful Learning Beaconing project deployed a number of assets and adopted the RAGE processes methodology <https://beaconing.eu/>.

Another EU funded research and development activity to use the processes, asset-based methodologies and business models developed is the Intelligent Verification/Validation for Extended Reality Based Systems project which aims to establish a sustainable competitive ecosystem of European technology and solution providers for interactive technologies. <https://iv4xr-project.eu/>.

In Portugal, The Escola de Policia Judiciara, the Portugese Police training academy have adopted the RAGE processes and deploy the assets with their development partners in their production of learning materials to help train their police officers to be sympathetic with victims of domestic violence and to satisfy a variety of other training requirements.

Recognition and Awards

Early indications of the potential international impact of the RAGE project were recognised in 2017 when it was selected by the European Commission as one of the finalists of the European Innovation Radar prize. This is a prize for the most promising Early Stage Innovations across the breadth of EU Horizon 2020 programme one of the key criteria for the award was impactful innovation.

Furthermore, in 2019, the project was highlighted as being one of the most significant research and innovation projects in the Netherlands.

International applied and leisure industry groups and their members have engaged with the project including the United Kingdom Interactive Entertainment (UKIE), the Dutch (Netherlands) Games Garden, Balkan and French Industries and further evidence of the impact of the project the RAGE Ecosystem, Where the process models and assets are located is that over 850

European industry representatives have directly engaged with the project outputs processes and assets. A number of technical 'hackathons' have tested the processes and assets in Amsterdam, Vienna and in Brussels at the European Parliament. This impact has also been recognised within the EU commission as evidenced by two awards for achievement granted to the project and in the ongoing and significant influence on policy development of future EU research in the applied games development space.

The following is an extract from the RAGE (644187) Project Final Review Report completed by the European Commission, highlighting the impact of the project; '*RAGE as flagship project in the field of advanced gaming has elaborated an ecosystem for the applied gaming market offering a portal in form of a marketplace for all stakeholders of the applied gaming industry.*'

Sustainability of impact is assured as is the legacy of the research outputs under the custodianship of the recently established, RAGE foundation. In summary, the international impact of the Business Modelling and Management of Asset based development for the Digital Games Industry Case Study has been significant in terms of take up of the models and processes and in serving to stimulate the use of new asset-based development methodologies to help gain competitive advantage in the emerging applied games industry in the UK, France, Portugal, Germany, Netherlands, Italy and Spain.

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

1. Links provided to information to the Technology with a societal Impact Exhibition at the European Parliament November 2018.

<http://rageproject.eu/rage-at-the-tech-with-a-societal-aspect-exhibition-in-the-european-parliament/>

<http://rageproject.eu/rage-goes-to-the-european-parliament/>

2. A link to video testimonials corroborating the use and impact of RAGE assets

<https://www.gamecomponents.eu/page/home>

The following are six testimonials provided by individual Game Development companies which corroborate the impact and cost benefit of engaging with the RAGE project and use of the individual RAGE components:

3. Case Study One - Jeremy Cooke Managing Director Gameware Europe (UK)

<https://www.gamecomponents.eu/page/case-studies> (Case Study 1)

4. Case Study Two – Jared Glass Lead Developer PlayGen (UK)

<https://www.gamecomponents.eu/page/case-studies> (Case Study 2)

5. Case Study Three – Jens Piesk Nurogames (Germany)

<https://www.gamecomponents.eu/page/case-studies> (Case Study 3)

6. Case Study Four – Jared Glass Lead Developer PlayGen (UK)

<https://www.gamecomponents.eu/page/case-studies> (Case Study 4)

7. Case Study Five – Thierry Platon Managing Director BIP Media (France)

<https://www.gamecomponents.eu/page/case-studies> (Case Study 5)

8. Case Study Six - Jeremy Cooke Managing Director Gameware Europe (UK)

<https://www.gamecomponents.eu/page/case-studies> (Case Study 6)

9. Letter of corroboration from Gameware Limited (as a user of the technologies and associated process and business Models)