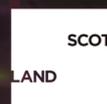# DATA PROVISION IN THE GAMES INDUSTRY IN SCOTLAND

FINAL REPORT

PRODUCED FOR CREATIVE SCOTLAND

By
**Dr Helen Mullen, Dr Matthew Barr
and Professor Colin Mason
The University of Glasgow**

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Executive Summary

Project background

This project was initiated to explore data-related issues in Scotland's games industry, an area that has been subject to debate within industry and government. The importance of Scotland's games industry has been highlighted by both industry and government organisations in Scotland and the UK. The industry's success is recognised both nationally and internationally and has been used in various guises to promote Scotland, recruit talent and attract inward investment. However, despite this level of interest and visibility, questions have been raised about how accurately the industry is portrayed given some issues with accuracy, availability and relevance of data about the games industry in Scotland. Industry practitioners, support agencies, public bodies and academic organisations have expressed data-related issues in various forums including committee hearings held by the Scottish and UK governments. While data about the industry do exist, there appears to be a lack of accessible public data that can provide the requisite detail, and limited integration of that data which are available. Such issues can negatively impact on decision-making by policy-makers and industry. For example, the 2015 enquiry by the Scottish Government's Economic Environment and Tourism Committee indicated that a lack of such data resulted in difficulties identifying the economic impact of Scotland's games industry.

Project aims, objectives and approach

This project was initiated as a first step towards examining such data-related issues by incorporating the views of data users and providers to provide a basis for future discussions. The aim was to examine how data in Scotland's games industry are perceived, identify if any issues existed and, if so, what might be done to address these. A key role was to provide a deeper understanding of data-related issues previously expressed by industry practitioners, support agencies, public bodies and academic organisations. The project objectives were as follows:

1. To identify whether data-related issues existed.
2. To highlight any limitations of such data.
3. To make recommendations for future data provision.

This project was undertaken by staff from the Adam Smith Business School and the School of Computing Science at the University of Glasgow, with funding support from the Economic and Social Research Council and Creative Scotland. Project activities included a review of industry, government and academic publications; consultations with 34 data users and providers from 30 organisations in the private, public and academic sectors; and engagement with industry-related stakeholders via a series of meetings, events, presentations and online activities.

Findings: The data provision

A review of the data provision identified the data types in use, the sources of such data, and the purpose to which data were being put. Each of these aspects was reviewed and categorised. This provided a detailed breakdown of the data provision that was used as a framework for examining data-related issues. Four types of data were identified. First, economic data, that is, information about the level of economic activity and the value of the industry, for example employment, GVA (gross value added), exports, turnover and the number of companies. Second, company-specific data described the industry participants and how they operated, for example geographic locations, activities, size, game types. Such data highlighted those operating in the industry and provided some insight into their activities. Third, industry dynamic-related data described how the industry operated, for example company start-ups/closures, infrastructure, value chain, etc., as well as indicating the historical evolution of the industry and the direction in which it was developing, e.g., trends and consumers. Finally, the fourth data category was industry issues, which related to information describing key issues affecting the industry and its development, for example tax credits, diversity, working practices, support needs, cultural aspects, and market trends. Consultees used five key sources to obtain such data: (i) industry-specific research and publications; (ii) government statistics; (iii) personal experience, knowledge and contacts; (iv) confidential company information; and, (v) open data. There was a higher level of reliance on data from personal sources and industry groups. However, consultees made use of all sources, usually combining different sources depending on the purpose to which the data were being put. Several publications were also highlighted as being more regularly used as they focused on specific industry issues such as economic impact, skills, and diversity. These included reports from the BFI, Creative Skillset, TIGA and the Creative Industries Federation. Data were used for three purposes in the main: (i) to obtain and maintain the consultees' own insight into the industry (i.e., understand the dynamics, improve their knowledge, and monitor the industry); (ii) to report on, and anticipate, needs/trends (i.e., project reporting, inform key issues and support needs, and forecasting); and (iii) to promote the industry and share information (i.e., attract investment, publicity, education, advocacy and member/client support). Consultees drew on all four data types across the range of sources to address their own needs.

Findings: Data-related issues and limitations

This project identified that data-related issues did exist, and several limitations were identified that resulted from both data-specific and industry-specific factors. Five data-specific areas were mentioned by consultees. First, there were some issues with data access being constrained, resulting in difficulties obtaining certain types of information and constraining an integrated picture of the industry. Second, accuracy issues were mentioned, particularly in terms of representing the industry. The third issue related to the appropriateness of the data sources, with some consultees raising the potential for

over-reliance on data from trade bodies/membership organisations, given their industry advocacy role. A fourth issue highlighted some concerns about statistical issues, particularly relating to economic data. The final issue mentioned was the limited representation of the industry. There was a perception that the breadth and value of the industry was sometimes overlooked, underestimated and misunderstood. Three industry-specific factors were also highlighted as issues. First, the characteristics of the industry made data difficult to capture, particularly in statistical terms, given the high level of small firms and high rate of change. Second, the lack of representation from within the industry, and a perceived lack of leadership and 'industry voice', were viewed as negatively impacting the positioning of the industry and its ability to lobby on issues such as data. Finally, the industry's importance was questioned by some consultees, which may have negative consequences for the level of support that is provided from non-industry bodies.

Findings: Improvements are needed to the data provision

Consultees, in the main, considered it important to have an informed, accurate and consistent data provision and that improving this provision could be beneficial in supporting the following:

1) Decision-making about the industry's development.
2) Creation of support interventions that are more tailored and resource efficient.
3) Improved monitoring, evaluation and benchmarking about the industry.
4) Promotion and visibility of the industry.
5) Decision-making by companies about their business case, internal ideas, and awareness of competition and comparators.
6) Advocacy for the industry and its needs.

Improvements to the data provision were suggested in five areas. First, data that more accurately represents the industry, reflecting the breadth and depth of activities and providing better insight into the participants, their activities and the issues that they faced. The second improvement was to facilitate access to existing data. While there was a range of data in existence, they were not always perceived as visible or accessible. The third area of improvement related to the development of statistical data to provide data that were timelier, comparable and which more accurately reflected the industry. The fourth area of improvement was to increase industry representation from within. While not a solely data-related issue, having more leadership from within the industry could improve the accuracy of how the industry is portrayed as well as provide a channel through which industry stakeholders could access data. However, this suggested improvement was not universal among consultees, with some disputing the need for changes to data provision. Finally, the use of new datasets, and approaches to data, were considered beneficial with consultees identifying various projects as being of relevance and expressing interest in discussing potential collaborations.

Options for development of the data provision

Four options are presented, one of which involves no action while the remaining three improve the data provision. The options are as follows: (i) Take no action on the data provision; (ii) make the existing data sources and data more visible; (iii) improve the data provision by addressing specific data issues and/or types; and, (iv) pursue a new approach that describes the wider industry components and activities in an integrated form – an ecosystem-type approach. There is no benchmark for determining what a 'correct' data provision consists of for any given sector; therefore, these options are based on the information provided by the consultees.

Recommendations

Assessing the feasibility and impact of such options, and the creation of an associated action plan, were not within the scope of this project. However, based on the project consultations, the recommendation in the short term is to address the weaknesses in data provision. Limitations have been identified in four types of data and across various sources. There are gaps in all the four categories (economic, company-specific, industry dynamics and industry issues), although the economic and company-specific data attracted the most attention from consultees and, therefore, could be prioritised. Initial engagement could incorporate the following:

1) Discuss and evaluate the findings from this project with key industry stakeholders.
2) Ascertain interest from industry including potential collaborators.
3) Identify and prioritise data-related deficits, considering the purpose and impact of the data, access mechanism, and frequency.
4) Agree objectives and outputs.
5) Agree an approach to addressing data issues (incorporating collaborative approaches as appropriate).
6) Allocate roles, responsibilities and resources.

Regardless of whether further action is taken to improve the data provision, it is recommended that there is engagement with those organisations involved in innovative data-related projects relating to games, creative industries and/or the use of open-data. This includes activities relating to data identification and capture in the areas of innovation and R&D, exports, economic contribution, and cultural impact; the trend towards more accessible and interactive data; and developments in the games industry itself relating to data, emerging organisations (i.e., BGI) and academic developments such as InGAME at Abertay University. Several such projects are currently being undertaken and several of the consultees expressed their interest in further discussions. Such organisations and projects can inform, and provide collaboration opportunities for, the development of a future data provision for Scotland's games industry. Finally, the longer-term recommendation is for a data provision that describes the industry ecosystem. This would provide a more accurate, real-time and user-focused data provision for stakeholders, while also having the potential to share learning with other organisations involved in games and/or similar industries. However, an important

element of any action is to ascertain the level of interest in, and potential involvement of, the industry in Scotland relative to data. Engagement is, therefore, required with industry to examine this perception and better understand the reality of this.

Next steps

This collaboration between the project partners and wider consultee network has provided new insight into the data provision about the games industry in Scotland. It has enabled a more nuanced view of data type, sources and usage, highlighted the perceived limitations of such data, and suggested improvements that could be undertaken. In doing so, various issues and questions have been identified that could be addressed in future work. The project outputs provide the basis for further engagement and actions to improve data provision. Such outputs complement other projects that the project partners have been involved in including the Creative Scotland-commissioned research into alternative data collection methods by We Throw Switches and IGDA Scotland, and the games developer business model project funded by the University of Glasgow's ESRC Impact Accelerator Account. The findings also have relevance for the wider games industry in the UK and the activities being undertaken by the British Games Institute and the InGAME initiative led by the University of Abertay. The collaborative approach to this project, incorporating the project partners and 30 organisations, has allowed the identification of specific issues, opportunities and questions that can be pursued in future projects to benefit the games industry in Scotland. There are likely to be more organisations that can engage in this process and progress this aim, and it is hoped that further engagement with existing and new consultees would be part of any future development.

University of Glasgow project team:
Dr Matthew Barr, Professor Colin Mason and Dr Helen Mullen

1 Introduction

The importance of Scotland's games[1] industry has been emphasised by various government and industry organisations[12] and it has been suggested that the industry's future should be a priority for Government.[3] The industry has also been identified as important for Scotland's other creative media activities.[4] Described as ""historically strong"[5] with "impressive output" despite its size,[6] Scotland's games industry is recognised internationally[7] and has generated some of the "most important development in games anywhere in the world."[8] Within the UK games industry, which itself has global potential,[9] two of the UK's 12 games development clusters have been evident in Edinburgh and Dundee,[10] with the latter city recognised internationally as "significant' for games."[11] The industry has also been the subject of attention from academics,[12] policy-makers,[13] public sector organisations[14] and industry bodies,[15] and its profile and success used for national and international promotional purposes[16] and to attract investment[17] and talent.[18] However, there has also been some uncertainty around the value and performance of the industry in Scotland and concern about the data provision and limitations therein:[19] "there is little accurate data available on the current state of the video games sector and its impact on jobs and the economy."[20] Such issues can, in turn, negatively impact the decision-making of policy-makers and practitioners, as was evidenced in the Scottish Parliament's Enterprise, Energy and Tourism Committee 2015 report: "The lack of accurate data has made it impossible for the Committee to determine the economic impact of the video games industry."[21]

The project detailed in this report was undertaken to investigate the extent to which such data-related issues existed in the games industry in Scotland. It involved staff from the Adam Smith Business School and the School of Computing Science at the University of Glasgow with funding from the ESRC's IAA fund[22] and Creative Scotland. The project built on other games-related activities undertaken by the University of Glasgow and Creative Scotland. This included Creative Scotland's work on industry engagement for data collection,[23] incorporating a review by IGDA Scotland and We Throw Switches,[24] plus the University of Glasgow's projects relating to business models for videogame developers.[25] The project's aim was to provide a first step towards clarifying data-related issues for the games industry in Scotland and, in so doing, support industry-related decision-making by support organisations, industry groups and policy-makers. There were three key objectives:

1. To identify whether data-related issues existed.
2. To highlight any limitations of such data.
3. To make recommendations for future data provision.

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[1] The term 'games' is used in this project (and by organisations such as Creative Scotland, Ukie, TIGA and ScreenSkills) but it also includes those industries referred to as Computer Games (Scottish Government) and Video Games (BFI, TIGA HMRC, Creative Industries Federation, UK Government).

The activities undertaken during this project are described in Section 2 while Section 3 provides an overview of the data-related issues that have been evident in recent years, providing some context for the current project. The findings from an initial review of secondary data about Scotland's games industry are described in Section 4, identifying the type and sources of data that make up the data provision. The outputs from the consultee discussions are provided in Section 5 (data source, type and usage), Section 6 (data limitations) and Section 7 (data improvements required). The conclusions reached in the project are detailed in Section 8 and the report concludes with the recommendations in Section 9.

2 Project activities

2.1 Stage 1: Clarification of supply and demand issues

The focus of stage one was to examine data provision and usage relating to the games industry in Scotland. The aim was to understand the existing data provision, any limitations of this and opportunities for improvements. Existing data were reviewed to understand data sources, identify any difficulties relating to access and dissemination, and highlight gaps in data provision. Data users were also identified, together with their requirements and any issues that existed with current data. Options for a future data provision were examined with data users and providers, taking into consideration data-related strengths and weaknesses, comparators and potentially complementary projects already in existence. This stage combined a review of secondary data from a range of published and online sources and discussions with 34 consultees from 30 games-related organisations from the public, private and academic sectors. Secondary sources included various publications relating to Scotland specifically, but also material about the UK games industry (and creative industries) within which mention of the Scotland games industry was made (see Table 2.1). The consultees were identified from a combination of secondary data, discussions with Creative Scotland, and the project team's knowledge of, and networks within, the games industry (see Appendix 1 for a list of consultees). Such discussions were undertaken using a combination of meetings, telephone and email depending on the availability and preference of the consultees.

Table 2-1 Data review sources

Data sources	Rationale	Examples
Government publications	Official data relating to the industry plus specific enquiries of relevance.	Scottish Government, UK Government, HMRC.
Industry membership organisations and networks	Games-focused organisations providing information to their members and the wider public, policy-makers and industry.	TIGA, Ukie, IGDA, Creative Industries Federation, BAFTA, Scottish Games Network, Creative Industries Council.
Public sector organisations with an interest in games	Sector-specific organisations involved in informing and/or supporting the games industry.	NESTA, Creative Industries Federation, BFI, Creative Scotland, Scottish Enterprise, Highlands and Islands Enterprise, Scottish Development International, Skills Development Scotland.
Academic publications	Researchers involved in Scotland's games industry and/or academic projects with relevance to games and/or data provision.	Researchers involved in areas such as business and management, intellectual property, data measurement, creative industries, games.
Industry and non-industry related media	Media-related usage of data such as press releases, industry or company profiles.	MCV, GamesIndustry.biz, newspapers, Scottish Games Network, MobyGames.

2.2

2.3 Stage 2: Engagement and dissemination

The second stage focused on engagement with industry stakeholders to share the interim findings and facilitate discussion. The project partners met to discuss the findings generated in stage 1 and agree subsequent activities. The interim findings were then shared with the industry via presentations at a few industry-related events, and online via websites and social media. A summary of the engagement activities is provided in Table 2.2.

Table 2-2 Engagement activities

Activity	Description	Dissemination	Audience
'BFI Video Game Day 2018', Edinburgh.[26]	A collaborative event between the British Film Institute, Creative Scotland and the University of Glasgow.	Presentation of project findings at event. [27] Slides shared via BFI and the University of Glasgow project websites, and social media (Twitter).	40-50 attendees from industry and the public sector.
'IGDA Scotland Members Meet up', Glasgow. [28]	Event for members of the International Games Developers Association Scotland.	Presentation of project findings at event[29]. Slides shared via the IGDA Scotland and the University of Glasgow project websites, and social media (Twitter and Facebook).	30-40 attendees from industry.
'BGI Continue Edinburgh' event, Edinburgh.[30]	A collaborative event by the British Games Institute, Riverside Studios, the University of Edinburgh, Creative Scotland and the Creative Europe MEDIA Desk Scotland for practitioners involved in video games and cultural sector.	Presentation of project findings at event.[31] Slides shared via the University of Glasgow project website.	25 attendees from games industry and/or the cultural sector.
University of Glasgow website[32].	Project page on the University of Glasgow's website.	Project website shared at presentations, events, with consultees and via social media.	Website users, event attendees, consultees.

2.4 Stage 3: Verification and reporting

The final stage of the project involved a review of the overall findings of the project. In addition to the feedback gained via the engagement activities, input was also sought from some consultees involved in the project. The draft report was shared and discussed with the project team and a final report was then prepared.

3   Data provision in context

This section provides some context for the project, with a short overview of the data-related issues raised about Scotland's games industry in recent years. There has been no games-specific review undertaken in Scotland, a factor highlighted by the trade body Ukie in 2015 to the Scottish Government's Energy, Economy and Tourism Committee.[33] However, the games industry was included in a review of the economic contribution of Scotland's creative industries in 2012, commissioned by Scottish Enterprise and Creative Scotland.[34] Some commentators within the games industry raised concerns that the games-related findings were inaccurate[35] and underestimated the size and value of the industry. These views were subsequently reflected in evidence submitted to government reviews[36] to highlight some of the difficulties associated with data classification, capture and measurement. The study's authors themselves identified various problems[37] with capturing statistical economic data relating to both the games industry and the wider creative industries, issues that have subsequently been reflected in other government and industry reports.[38]

Following the 2012 study, and discussions between Creative Scotland, Scottish Enterprise, the Scottish Government and the Scottish Games Network, a review of certain games-related statistics was undertaken by the Scottish Government.[39] This involved a comparison of such statistics with a list of companies in the Scottish Games Network Company Directory[40] and led to the identification of data-related issues and a number of improvements being made. The Scottish Government detailed the work that was undertaken and highlighted the data issues encountered and the revisions made.[41] Three key elements were highlighted:

(i)   Misalignment with the Inter-Departmental Business Register
The 77 developers and publishers listed in the Scottish Games Network's Company Directory (as at October 2012) were compared with the Inter-Departmental Business Register (IDBR)[42] data, a database of UK companies used by the Government for statistical purposes. This review identified that 45 companies (58%) were included in the IDBR but 32 companies (42%) were not.

(ii)   Difficulties in capturing data about small and new companies
The 32 (42%) companies that were in the Company Directory, but not included in the IDBR, were reviewed using data from their own company websites and Companies House and identified as very small or new. The size and newness of some games companies affected their inclusion in statistics, despite being operational, visible and registered at Companies House. UK companies registered for VAT/PAYE are listed on the IDBR, which is used by the Office of National Statistics (ONS) as the starting point for business surveys to collect economic data. This includes the Annual Business Survey (ABS)[43] (i.e., detailed industry sector estimates of turnover, purchases, GVA) and the Business Register and Employment Survey (BRES)[44] (i.e., detailed industry sector estimates of employment). Companies that are not listed in the IDBR are not

being included in such surveys. This coverage issue has been recognised in relation to, for example, GVA[45] and employment.[46]

(iii)   Issues arising from employment data

BRES employment data for the 45 companies indicated 600 employees.[47] However, 400 of these were outside of the SIC codes[48] for computer games and, instead, listed in one of three other categories: 'computer consultancy activities', 'other information technology and computer services activities' or 'other codes.' The ONS subsequently reclassified the companies from two of the categories accounting for 300 of the jobs, namely 'computer consultancy activities' and 'other information technology and computer services activities.' Changes were also made to the IDBR and, therefore, incorporated into any subsequent research incorporating this data, including BRES employment data and ABS data about turnover, GVA, etc. The 100 remaining jobs remained in the other SIC codes.

Data-related concerns continued to be raised by industry and government, including in evidence provided at both the 2015 Scottish Government Economy, Energy and Tourism Committee enquiry[49] on the film, TV and video game industries, and the 2016 Scottish Affairs Committee enquiry on Scotland's Creative Industry Sector.[50] In 2015, Creative Scotland,[51] therefore, consulted with TIGA and Ukie and collaborated with the Scottish Games Network to develop a survey designed to better understand and track the games industry in Scotland. The aim was to operate four surveys, one every six months over a two-year period. The surveys commenced early in 2016 and were undertaken in collaboration with Scottish Enterprise as an outcome of the 2016 Scottish Affairs Committee inquiry into the creative industries in Scotland.[52] The first survey was undertaken in January and February 2016 and received over 150 respondents. However, the second survey during May and June 2016, received only 10 responses with some questions being answered by only two respondents. Given the poor response rate of the latter, rather than undertake another survey, Creative Scotland consulted with the industry via IGDA Scotland to inform subsequent actions. It was suggested that the survey approach was ineffective in attracting interest or reaching the correct participants. Creative Scotland subsequently supported an alternative method of data collection that was piloted in 2017 and 2018 by IGDA Scotland and We Throw Switches. This involved the creation of a 'Survey Cabinet' for data collection purposes. The cabinet was styled after a traditional arcade machine that displayed a series of multiple-choice questions for respondents to answer by striking a selection of large buttons. Respondents interacted with the Survey Cabinet and provided data on a range of issues. The findings were reported to Creative Scotland in 2018.[53] During 2018, Creative Scotland also collaborated with the University of Glasgow on this current project, building on the previous activities of both organisations, with a focus on engaging with data users and providers to better understand the existing data provision and identify where improvements could be made, if required. The remainder of this report focuses on the findings from that project and the recommendations that resulted.

4   Secondary data review: Data classification and sources

A review of the secondary data provision was undertaken to identify the types of data that existed about Scotland's games industry. This section illustrates the types and sources of such data plus a range of examples of data outputs. The review focused on data that were specific to Scotland's games industry but also included some UK-level data where relevant. Data identified during the review were classified into four categories: economic, company-specific, industry dynamics and industry issues. These are illustrated in Table 4.1 and discussed further in the remainder of this section.

Table 4-1 Data categories

Data type	Examples of content	Examples of sources
Economic	Data relating to economic status and impact, e.g., employment, GVA, turnover, number of companies.	Scottish Government, DCMS, HMRC, BFI, TIGA, Creative Industries Federation, Scottish Enterprise, Creative Scotland.
Company-specific	Company-specific data about who they are and how they operate such as location, activities, games/platforms, employees, financials.	Trade publications (e.g., MCV, Gamesindustry.biz), SGN Company Directory, Scottish Development International, Ukie games-related sites, academic researchers, DIT.
Industry dynamics	Information about how the industry works, who's involved, how it evolved and its future development, e.g., participant types, company start-ups/closures, networks, value chain, relationships, trends, audience.	Scottish Enterprise, NESTA, Scottish Development International, Curator Technologies, academic researchers, Ukie, Mintel, GfK Entertainment.
Industry issues	Data relating to key industry issues and needs, e.g., diversity, skills, business support, and cultural impact.	NESTA, TIGA, Ukie, Creative Skillset, Skills Development Scotland, BFI, Creative Industries Federation.

(i)   Economic data

The economic category describes data related to the specific economics of the games industry; for example, employment, GVA, GDP, turnover and the number of companies. The purpose of such data was usually to indicate the level of economic activity and value of the industry. Data in this category were usually statistical and quantitative in nature. Economic data tended to be provided by the Government or other public sector organisations such as the Scottish Government (e.g., Growth Sector Statistics Database and briefings[54]), DCMS (e.g., Sector Economic Estimates[55]) and HMRC (e.g., statistics on tax relief relating to video games[56]). Other sources of economic data included research commissioned by public and private sector organisations which, while not all specifically focused on Scotland or games, contained relevant information. During 2018, the economic data used to describe the Scottish

games industry in the media or by policy-makers were, in the main, sourced from Scottish Government, TIGA or Ukie, although there were variances in the data reported. Some examples of economic data outputs are as follows:

- *Economic contribution of the industry,* including reports from BFI and partners[57] and Oxford Economics.[58]
- *Economic contribution of Scotland's Creative Industries,* commissioned by Scottish Enterprise and Creative Scotland.[59]
- *Scottish Government Growth Statistics Database* [60] providing, for example, company numbers, jobs, turnover, and contribution to GVA.
- *Exports*, such as the report from the Creative Industries Federation, Creative Industries Council and Cebr about creative industries exports.[61]
- *Economic related data about the UK games industry* contained in Ukie's Information hub which links to information from various data providers.[62]
- *Economic data such as jobs, turnover, and number of companies* provided by TIGA's annual survey of the UK industry, undertaken with Games Investor consulting, and which includes figures for Scotland.[63]
- *Number of games companies,* highlighted in the Ukie Games Map.[64]
- *Market information* such as PwC's annual Global Entertainment and Media Outlook.[65]
- *Skills-related data* such as that contained in Skillset's Market Intelligence Digest for Computer Games.[66]

(ii)   Company-specific data

This category referred to data about the actors within the industry including the companies, freelancers and networking organisations. Data included company listings/directories as well as information about how such actors operated, for example, geographic locations, activities, size, and game types. The purpose of such data was usually to provide more insight into companies. Data were both qualitative and quantitative in nature although the former appeared more prevalent. Data providers were from both the public and private sectors. Some examples of data outputs are as follows:

- *Company Directory* provided by the Scottish Games Network.[67]
- *Company location and activity data* provided via the UK Games Map incorporating geographic details of developers and publishers, service companies, and universities, plus the volume of games released and percentage breakdown by platform.[68]
- *Company and industry information* such as that generated in DIT's overseas promotional work.[69]
- *Games product-related activities* such as those detailed on industry sites, for example MobyGames.[70]

- *Company profiles* from trade publications such as MCV, DIT Gamesindustry.biz, etc., and/or books/publications.[71] such as those generated by Scottish Development International.[72]
- *Case studies* by academic researchers about the Scottish industry and companies therein focusing on topics such as management,[73] business models,[74] innovation,[75] intellectual property[76] and economic and management issues.[77]

(iii)   Industry dynamics data

This category described data relating to the mechanics of the industry and the key trends therein. This included information about the type of individuals/organisations involved, value chain relationships, networks, investment levels, company start-ups and failures, industry evolution, market demographics and trends. The purpose of data in this category was usually to provide insight into how the industry operated and/or illustrate its historical evolution and the direction in which it was developing. Data were both qualitative and quantitative in nature and were provided (or commissioned) by the public sector, academic researchers and trade bodies. Examples of data outputs are as follows:

- *Geographic clusters of creativity* as reported by NESTA.[78]
- *Industry insight and commentary*, for example, from Scottish Development International 2008.[79]
- *Innovation* related issues such as those explored by NESTA.[80]
- *Information access points*, for example Ukie's Information Hub that links to data from a range of sources.[81]
- *Historical data* covering the evolution of Scotland's industry, companies and products provided by industry and academic publications.[82]
- *Skills and development needs*, for example the European-funded 'Honeycomb Creative Works' project that incorporated western Scotland and included the University of the West of Scotland as a partner.[83]
- *Culture and creativity,* for example, projects undertaken by NESTA[84] and academic researchers,[85] the interest/involvement of Creative Scotland in this area, and the in-house work undertaken by the British Council.[86]
- *Company/industry development needs* [87] such as those explored by Creative Scotland, IGDA Scotland, the University of Glasgow and Ukie.
- *Consumer data* incorporating consumer spend, profiles and market trends were available on Ukie's site[88] but, more usually, were evident from private sector sources such as Newzoo, Kantar and GfK Entertainment.[89]

(iv)   Industry issues data

This category incorporated data relating to current and future issues affecting the games industry. Examples included skills, tax credits, diversity, working practices, support needs, cultural aspects, consumption and market trends. The purpose of such data was to better understand the industry's needs and to inform future activities and support.

Both qualitative and quantitative data were evident. Data providers tended to be industry organisations and public sector bodies particularly NESTA, TIGA and Ukie, while private sector organisations were more evident for data relating to market and consumer focused profiles and trends. Some examples of industry issue-related data are as follows:

- *Strategy and development,* for example research undertaken by government and industry-related organisations about the industry's future by DBERR,[90] Ukie,[91] TIGA, [9293] the European Commission, [94] NESTA [95] and Games Investor Consulting.[96]
- *Tax credits* such as NESTA's research in relation to cultural video games.[97]
- *Skills*, for example, the reports from NESTA and Livingston and Hope [98] and Skillset.[99]
- *Cultural impact,* including NESTA's research relating to the cultural impact of games in England.[100]
- *Data improvement,* including projects undertaken by NESTA, Ukie, Creative Industries Federation[101] relating to defining and measuring different data types.
- *Women in Games,* for example, research from Skills Development Scotland.[102]

This section provided an overview of the data type, sources and outputs that were evident in the secondary data relating to Scotland's games industry. The next section presents the feedback from the consultees about the type and sources of data used.

5 Consultations: Data sources, type and usage

Discussions were held with 34 consultees involved in data provision and use, with the aim of identifying the type and sources of data used and the purpose for which data were obtained.

5.1 Data sources used by consultees

Five sources of data were identified, namely: (i) industry-specific research and publications; (ii) government statistics; (iii) personal experience, knowledge and contacts; (iv) confidential company information; and, (v) open data. These sources are illustrated in Table 5.1 and discussed in the remainder of this section.

Table 5-1 Data sources used by consultees

Number of consultees using this source	Data source	Description of data	Examples of data sources
28	Industry-specific research and publications.	Company and organisation related information, e.g., activities, location, games, etc. Industry-related activity at local and national levels such as economic trends, diversity, women in games, skills, clusters, trends, plus organisational and company information. Data relating to sales, consumption, audiences, games releases.	BFI, Creative Scotland, Creative Skillset, Creative Industries Federation, TIGA, Ukie, Skills Development Scotland, Scottish Games Network, IGDA Scotland, Oxford Economic, Creative Chronicles, Curator Technologies. GfK Entertainment, Scottish Enterprise, MobyGames, Develop.
26	Government statistics.	Economic data about exports, employment, turnover, GVA, GDP, number of companies.	Scottish Government, DCMS, ONS, HMRC, BFI, Companies House.
23	Personal experience, knowledge, and contacts.	Company details (e.g., location, activities, employees, games, history), personnel information, relationships, influencers/ gatekeepers, key issues, and events.	Individual personnel within public, private and academic organisations, direct engagement, events, etc.
16	Confidential company information.	Company-specific information for funders/support agencies used in individual and aggregated form.	Scottish Enterprise, Highlands and Islands Enterprise, Games Fund, BFI, professional advisers.
8	Open data	Diverse types and sources of industry and economic data from which games-related data can be obtained and integrated.	LinkedIn, recruitment sites, government statistics, IMDB, MobyGames.

(i)   Industry-specific research and publications

Industry-specific research and publications were one of the main sources of data. This source was used by 28 of the consultees. Data about companies and the industry were accessed, including commissioned research about issues such as economic impact, skills, women in games (e.g., BFI, Skills Development Scotland, Creative Scotland, Scottish Enterprise); games-specific publications/websites containing sector and/or company profiles (e.g., Develop, Gamesindustry.biz, Creative Chronicles, Scottish Games Network, SDI, Abertay University's games product timeline); information provided by trade bodies (e.g., the Ukie Games Map and factsheets, TIGA briefings and research, Creative Industries Federation reports, IGDA Developer surveys) and market-related data such as trends, consumer demographics, consumer spending and games release/success data (e.g., private organisations such as GfK Entertainment, Mintel and MobyGames).

(ii)   Government statistics

Governmental organisations were used as data sources by 26 consultees, who viewed such official data sources as relatively reliable, consistent and robust (although various caveats are mentioned and discussed in Section 6). Data sources mentioned included the Scottish Government, DCMS, Companies House and the BFI. The type of data accessed included employment statistics, GVA, number of companies.

(iii)   Personal experience, knowledge and contacts

Twenty-three consultees used their personal experience, knowledge and contacts as sources of data. Such sources were viewed as providing timely, up-to-date information about local activities and as a way of triangulating data with other sources such as statistics. While the anecdotal, and sometimes locally-focused, nature of the data was recognised, such data sources provided consultees with a direct route to regular, real-time data and a 'feel for the industry'. The use of such sources was apparent across both the public and private sectors, with trust, relationships and authenticity being important in gaining access to this data. Reference was made to the regular interaction that such consultees had with the industry via, for example, their contact network, attendance at events, market visits, word-of-mouth, internal discussions and the companies themselves.

(iv)   Confidential company information

Sixteen of the consultees mentioned using company-specific data that they had access to via their own organisation, although the confidential nature of such information limited how it could be used. Public and private organisations were usually the sources of such data, for example Scottish Enterprise, the Games Fund and BFI, as were membership organisations such as Entrepreneurial Scotland and Ukie. Such data were usually generated from account management activities, funding applications, project evaluations and CRM activities, having been obtained from companies, for example, as part of a funding or support requirement.

(v)   Open data sources

Eight consultees had generated, or accessed, data from sources experimenting with new approaches to data collection and management. The sources mentioned were not all games-specific. However, the datasets and approach had potential application in the games industry.   Sources mentioned included datasets relating to recruitment, accountancy, game releases, and games media from various private sector companies such as Burning Glass, LinkedIn, GlassDoor and MobyGames (some examples are provided in Section 7.5). Collaborations were evident across the private, public and academic sectors. The main driver for consultees involved in such projects, was to create a more integrated and accurate picture of the industry by bringing together data from a range of datasets.

5.2   Data use by consultees

Consultees used data for three key purposes: (i) real time information; (ii) reporting; and, (iii) promotion and information sharing. The first purpose related to obtaining real-time information about company- and industry-related activities to ensure they were up-to-date about the dynamics of the industry. This was mostly driven by consultees seeking to improve their knowledge, maintain contacts, and increase their interaction with the industry. The second purpose was to report on the use of, or inform the application of, funding and support. Confidential company-specific data about support recipients and applicants was used for internal and external reporting to funders. This also provided insight into (albeit confidential), for example, company-specific activities, financials, working practices and helped inform consultees' contextual knowledge. Consultees also used data to inform internal and external stakeholders about emerging issues for industry (such as skills and diversity) and companies (business needs) to highlight and anticipate potential interventions or the need for data. The third and final use of data was for promotion and information sharing. Consultees used (or responded to requests for) data for publicity purposes, normally facts and figures about the industry or companies. They also shared data for educational purposes to improve the perception of the industry among potential entrants and/for research purposes. Data about the industry were also employed for lobbying purposes to ensure the industry remained visible and its needs evident while promotional purposes included using the industry to attract investment or staff and/or position Scotland positively. Data were also used by membership-based organisations and professional services to provide clients with information about industry issues, support, etc. The consultees' use of data, and the type of data used, is summarised in Table 5.2.

Table 5-2 Data type and usage by consultees

Purpose of data	Specific uses of data	Number of consultees using this source for this purpose	Examples of data use	Category of data used*			
				E	CS	ID	II
Obtain and maintain insight about the industry	Understand industry dynamics	23	Identify who exists, their activities, opportunities, and industry activity.		X	X	
	Improve knowledge	23	Ensure familiarity about, and connections with, the industry.	X	X	X	X
	Monitoring/ anticipating changes	21	Identify and evaluate growth, trends and benchmark.	X		X	
Reporting and anticipating needs/trends	Project reporting	17	Reports for funders and stakeholders – internal and external.	X	X		
	Inform key issues	16	Identify and inform key themes for the industry, e.g., skills, diversity.	X	X	X	X
	Inform support needs	13	Identify and inform company support needs.		X	X	X
	Forecasting	12	Identifying relevant trends.			X	X
Promotion and information sharing	Attract investment	9	Promote the industry/place to attract skills, inward investment.	X	X	X	
	Publicity	9	Industry/company information for the media, government and public.	X	X		
	Education	9	Increase awareness about opportunities and realities (e.g., potential entrants, parents, teachers) and information to academics for research.	X	X	X	X
	Advocate	8	Promote and lobby on behalf of the industry.	X	X	X	X
	Member/ client support	8	Information to members/ clients by membership-based organisations and professional advisers.	X	X	X	X

*Key to Table 5.2

E: Economic data.   CS: Company-specific data.
ID: Industry dynamics.   II: Industry issues.

6 Consultations: Limitations of existing data

Most consultees mentioned several limitations relating to the current data provision, arising from both data- and industry-specific factors. Such factors are discussed in this section. However, several consultees did not mention any limitations and questioned the need for change, stating that the current provision was adequate, and that Scotland-specific data could not be justified given the industry's small size.

6.1 Data-specific factors

6.1.1 Data access

Aa variety of factors restricted access to data. This presented difficulties in obtaining certain types of information or gaining a comprehensive perspective of the industry. First, some consultees had found it difficult to obtain information from some public sector sources about games companies due to the confidential nature of the data. The issue of confidentiality was also raised in relation to tax relief data from HMRC and BFI. While the data provided about tax relief was considered useful, there were restrictions for data protection purposes that resulted in data being reported about the games themselves, rather than any information about the companies and their geographic location. Although this was not preventative, as the additional data could be gathered, data restrictions made access more difficult. Second, the cost to access certain types of data were sometimes preventative, such as those associated with access to private sector data about audience figures and industry trends or the membership fee requirement for some industry organisations. Third, the reliance on personal experience, knowledge and contacts meant that there was a need for regular immersion in the industry. Most consultees expressed the importance of maintaining close connections to the industry and were active in doing so via many routes. However, this was resource-intensive; therefore, the lack of such resources, or access to the sector, inhibited familiarity and prevented data being obtained. Such data were, also, not always formally recorded and monitored and were, therefore, difficult to replicate and share in any structured, comparable format. The fourth factor affecting data access was the absence of a central, recognisable data access point(s), which meant that data were not always visible or evident. Even where consultees were aware of the existence of data, accessing the different types/sources to create an integrated narrative was time-consuming and subjective. Finally, the format of some data was considered a constraint on access. For example, despite some datasets being open, they were considered too complex to use, had a degree of uncertainty associated with them, and some technical issues were apparent; for example, several consultees mentioned that not all Companies House data was in a format that was machine readable.

6.1.2 Data accuracy

Data accuracy was mentioned as a limitation, resulting in some data being perceived as unreliable or not fit for purpose. Various factors were mentioned as negatively influencing accuracy. First, the data did not always capture the high level of small companies and freelancers, sometimes due to a lack of visibility and/or difficulties reaching such companies. Second, there were issues with data reporting such as inaccurate representation of company activities (e.g., misapplication of SIC codes), limited financial reporting requirements for small companies, and limited access to confidentiality data relating to company activities. Third, there were issues with the timeliness of data due to the lack of available up-to-date information and a reliance on historical data in some subject areas. Fourth, the issue of validity was mentioned in relation to the absence of, and uncertainty about, confidence levels for data. Finally, some data collection methods were thought to affect data accuracy, particularly surveys. Survey fatigue was mentioned together with the suggestion that survey was not always an appropriate method for reaching relevant respondents nor in gaining the type of data required. Some specific data sources were also mentioned as having accuracy issues including the Ukie Games Map, the Scottish Games Network Company Directory and the TIGA annual survey. The Ukie Games Map was perceived as useful in providing data about the volume of companies and geographical spread. However, there were limitations relating to the lack of regular updates, the requirement for companies to input their data, and a perceived misalignment with what the map represented compared to consultees' knowledge about their own localities. The Scottish Games Network Company Directory had provided a listing of companies, although its limited resources and reliance on volunteers meant that it was sometimes out of date. Finally, the TIGA Annual Survey provided Scotland-specific data but there was some uncertainty about how much of the data was collected from the industry in Scotland and from whom.

6.1.3 Appropriateness of data sources

In terms of appropriateness, there were questions from some consultees about over-reliance on data generated by trade organisations such as Ukie and TIGA that had an inherent interest in the industry. This was particularly the case with the economic data provided in the TIGA Annual Survey, used in the media, Government enquiries, and by the public sector. Several consultees regularly used TIGA data and compared/combined these with other government statistics, while others questioned them and avoided their use. Not all consultees used data from such organisations, with some criticism that they were London-centric and lacking a presence in Scotland.

6.1.4 Issues with statistical data

Consultees used statistical data about companies and the industry. However, there were several issues raised in relation to such data. First, in terms of data capture, there

were some difficulties in obtaining statistical data about companies in an industry where there are high levels of small companies and sole traders. This includes the limited financial reporting requirements (for example at Companies House) given their small size. Second, there were, sometimes, limited detailed data, with some statistical data described as too high-level to provide the detail needed by consultees. Third, games companies do not always apply the correct SIC codes (SIC 58.21 and SIC 62.01/1), [103] [104] an issue that Ukie has been encouraging companies to address.[105] Finally, variations in data sources were mentioned as an issue. For example, in Scotland, games-related employment data are sourced from BRES whereas at a UK-level, the APS is used. According to the Scottish Government, using the APS for this sector in Scotland would be challenging given the small size of the sector and, therefore, very small APS sample size.

6.1.5 Limited representation of the industry as a whole

Some consultees perceived that the breadth of, and dynamics within, Scotland's games industry were sometimes overlooked and underestimated. There were, therefore, suggestions for a wider range of data that would provide a more accurate representation of the industry, and a better understanding of how the industry ecosystem worked. While quantitative, statistical data were useful, more qualitative data were suggested as a way of gaining further insight. Suggested types of data included information about the range of industry participants (including those not captured by economic statistics), the variation in type and focus of organisations (for example, freelancers, artist game-makers and more creative practice-focused activities were not always represented), the roles played by different organisations, game-related activities including game types, platforms and releases, and the cultural activities and associated impact which were overlooked and under-reported. However, it was acknowledged that there were limitations on creating this type of rich data, particularly in terms of data collection costs, time and management.

6.2 Industry-related factors

Three industry-related factors were identified as limitations. While not data-specific, they were perceived as having a negative influence on how data provision was perceived and supported. The key factors were: (i) the characteristics of the industry; (ii) the lack of representation from within the industry; and, (iii) uncertainty about the industry's importance.

6.2.1 Characteristics of the industry

The characteristics of the industry itself were mentioned as limitations in achieving an accurate and reliable data provision. Such characteristics were perceived as constraining the capture of accurate data and, in turn, under-representing the industry. Factors mentioned included the high level of fragmentation and the diverse range of

participants, activities and ad hoc networks, which can make collecting data difficult. For example, freelancers can work across disciplines and on a temporary basis and may not be captured in data while the nature of projects may mean that a company's employee numbers increase on a temporary basis. Information can also become dated quickly given the high rate of change within the industry, for example the frequency of company start-ups and closures, and financial data can be inaccurate given the limited reporting requirements for small companies. There were also industry-related limitations mentioned in relation to open-data projects, for example where games release-based datasets used in tracking company activities were limited to focusing on 'off-the-shelf' games as work-for-hire and in-house projects were difficult to identify.

6.2.2 Lack of representation from within the industry

Consultees mentioned the lack of industry representation as having an impact on the perception of the industry and, in turn, the data provision (and/or the interest in this). It was suggested that an 'industry voice' was lacking as a result of limited leadership from within the industry and no clear representative industry body. The perceived absence of this was felt to have negatively impacted the level of advocacy that could be undertaken on issues such as data provision, an industry strategy and evidence-based support initiatives. Some consultees suggested that there was no evidence to suggest that the industry was interested in the data provision, given that it was not advocating for it. Some consultees contrasted this lack of industry representation, with that relating to Scotland's screen industries where advocacy, visibility and strategy had been very evident and have led to the establishment of Screen Scotland.[106]

6.2.3 Uncertainty about the industry's importance

Despite the evidence of Scotland's games industry being promoted as important by industry and the Government, this was not evident across all consultees. Some consultees suggested that Scotland's games industry was relatively unimportant, given its small size, limited growth and company ambition. However, other consultees disputed this. There was also uncertainty among consultees about the respective roles of Scottish Enterprise and Creative Scotland in the games industry, particularly in relation to their responsibilities. This lack of visibility of ownership, interest and/or involvement could also contribute to the perception that the industry is not important and, in turn, have a negative impact on the level of resource and support that is provided to the industry, including that for data provision.

This section has provided the outputs from discussions with the consultees about the limitations of the current data provision and the factors influencing this. The next section discusses the consultees' suggestions for improving data provision.

7 Consultations: Data provision improvements

Consultees were asked what, if any, improvements could be made to the existing data provision, based on their experiences of data use/supply and any relevant comparators and best practice. Apart from two consultees, there was a feeling that data should be improved to support the following activities:

1) Decision-making about the industry's development.
2) Creation of support interventions that are more tailored and resource efficient.
3) Improved monitoring, evaluation and benchmarking about the industry.
4) Promotion and visibility of the industry.
5) Decision-making by companies about their business case, internal ideas, and awareness of competition and comparators.
6) Advocacy for the industry and its needs.

Consultees suggested five areas where improvements could be made. These are presented in the remainder of this section.

7.1 A more accurate representation of the whole industry

There was a requirement for information that reflected the breadth and depth of the industry and provided more insight into the participants, their activities and the issues they faced. Improvements were suggested across all four data types. First, economic data could be developed to provide more accurate statistical data about, for example, companies and sole traders (the new Statistical Business Register, developed by the Office for National Statistics (ONS), includes smaller businesses that are not VAT or PAYE registered and, therefore, may improve data accuracy). Second, more detailed information was required about the companies themselves (for example, their location, activities, employees, finance, game releases, salary levels, diversity policies) and the breadth of organisations within the industry (for example, freelancers, artist game-makers and more creative practice-focused activities that were not always represented). A company list/directory was also suggested by some consultees. Third, industry dynamics data could be improved to provide a better insight into the wider industry ecosystem and the activities therein. This could include information about company start-up/closure, relationships, networks, freelancer activity and graduate activity/ pipeline. Finally, more data about industry issues were sought, with consultees mentioning diversity, cultural impact, skills and support needs in this category. Existing diversity-related research was out-dated and cultural considerations and impact were overlooked and under-reported, with limited acknowledgement of artistic and cultural focused activities and impact.

7.2 Easier access to existing data

While there was a range of data in existence, such data were not always perceived as visible or accessible. Consultees suggested raising awareness of existing data and provide access points to such data and associated updates. Access to some data was provided on a membership-base only (e.g., trade organisations) or it required regular communication and connection with the industry. For those consultees not immersed in the industry, or where games were not their sole focus, having a signpost to more reliable, valid sources of data would be useful. Improved data collection methods that facilitated access to, and engagement with, the correct industry respondents were also mentioned. Such methods could incorporate new approaches to interacting with new/different datasets.

7.3 Development of statistical data

Consultees mentioned the limitations of statistical data, particularly relating to economic data, and addressing such limitations was thought to be beneficial. The requirement was for data that were timelier, comparable and which more accurately reflected the industry. The improvements mentioned included the provision of more accurate data about small companies and sole traders, ensuring that the correct SIC codes were applied by companies, and considering different (and non-traditional) datasets. Any such changes were, in the main, viewed as a longer-term activity, although some consultees mentioned that discussion were underway between the Government and industry bodies (the Scottish Government indicated that the best sources for economic data were currently being used, given the size of the sector, but that this would be revisited when the new ONS Statistical Business Register became available).

7.4 Increased industry representation and engagement

Some consultees felt that the industry would benefit from more visible representation and leadership from within, suggesting that stronger industry representation could support a more accurate portrayal of the industry and provide insight into the activities therein. It was suggested that taking a more integrated approach to representing the industry might provide a channel through which industry stakeholders could increase their awareness of, and access to, data. It was also suggested that an opportunity existed for key figures and/or respected organisations to champion the sector, provide a stronger voice externally and encourage more interaction between actors internally. Such activities could also help the industry lobby more strongly for recognition and/or support, including any improvements required to the data provision. However, not all consultees agreed that any changes were required concerning how the industry was represented, with some questioning the importance of the industry and the relevance of industry representation/strategy as part of a data review.

7.5 Explore opportunities presented by partnerships and technology

There are opportunities to address industry data issues by exploring new approaches to data capture and management that better reflect the characteristics of the industry, are more aligned with user needs, and can overcome the limitations of current approaches. New approaches to data capture and management have emerged and are evident in the games and wider creative industries. These include new datasets and data capture techniques such as text mining and data scraping. A summary of some of the projects suggested by the consultees is provided in Table 7.1. Such approaches can provide a broader, more holistic representation of the industry – its ecology – and improve the regularity of data. Several activities focused on games-related data issues and/or examining new methods of data collection, were identified during the project that may be synergistic for future data provision in the Scottish games industry. Further engagement can be pursued with consultees who expressed their interest in further discussions about such a data provision and/or sharing their experiences; for example, Ukie, NESTA, BFI, Dundee City Council, Curator, IGDA Scotland, Skills Development Scotland, Northern Ireland Screen and Creative England.

Table 7-1 Opportunities for knowledge share and collaboration

Project	Description
Coventry and Warwickshire games industry[107 108]	Collaborative projects between Ukie and the public sector in Coventry and Warwickshire including an assessment of the economic and cultural contribution of the games industry, the development of an industry strategy and skills development.
Create/ converge[109]	European-funded project involving Dundee City Council and public, academic and industry partners using new technologies and games/economic datasets including games sites such as MobyGames and Companies House.
Curator Technologies[110]	A data service launched in 2018 that supports company location-related decisions. It incorporates several innovative datasets and has been used for games industry-related activities.
Access to new and existing datasets[111]	Various accessible and interactive data-related projects involving publicly-funded organisations, e.g., ONS, Dundee City Council, NESTA plus developments in the private sector relating to datasets linked to recruitment, games products and employment from companies such as Burning Glass, LinkedIn, GlassDoor and MobyGames.
The V&A Dundee	V&A projects relating to games including the possibility of a V&A software library project.
Non-games specific data capture[112]	Various data-related projects in non-games-specific activities, that have relevance for the games industry, for example Technation at a UK-level and ScotlandIS in Scotland.
InGAME[113]	Multi-million-pound collaborative project led by the University of Abertay aimed at creating a research and development centre for the Dundee video games cluster.
British Games Institute (BGI)[114]	The emergence of the BGI and its role in the games industry.
Screen Scotland[115]	A new partnership within Creative Scotland focusing on developing the screen industry, involving Scottish Enterprise, Highlands and Islands Enterprise, Skills Development Scotland, Scottish Funding Council and funding from the Scottish Government and the National Lottery.
Cultural impact[116 117 118]	Organisations interested in assessing the cultural impact of the games industry, e.g., NESTA, Ukie.
Developments in the wider creative industry context[119]	Data-related projects linked to Innovation and R&D (e.g., NESTA) classification and measurement (e.g., Scottish Government, Creative Scotland, DCMS) and economic contribution (e.g., BFI and partners).

This section has reported on the consultee feedback relating to improving data provision and concludes the findings from the discussions with consultees. The next section provides a conclusion to the report, summarising the project outputs.

8 Conclusions

The aim of the project was to provide a first step towards clarifying data-related issues for the games industry in Scotland and, in so doing, support industry-related decision-making by support organisations, industry groups and policy-makers. The three project objectives are listed below and are addressed in the remainder of this section:

1. To identify whether data-related issues existed.
2. To highlight any limitations of such data.
3. To make recommendations for future data provision.

8.1 Data provision

In order to review whether issues existed relating to Scotland's games industry data provision, the provision itself was first reviewed and defined. The provision was divided into three aspects, namely the data types in use, the sources of such data and the purpose to which data were being used. Each of these aspects was reviewed and categorised, providing a detailed breakdown of the data provision that was used as a framework for considering where, if at all, data issues were evident. The data types, sources and usage are now discussed.

8.1.1 Data provision consists of four types of data

Data types were categorised as economic, company-specific, industry dynamics and industry issues. First, economic data incorporated data such as employment, GVA, exports, turnover and the number of companies and provided information about the level of economic activity and the value of the industry. Data in this category were usually statistical and quantitative in nature and provided, or commissioned, by the Government or other public sector organisations. Second, company-specific data described the industry participants and how they operated, for example geographic locations, activities, size, game types. Such data identified who was operating in the industry and provided some insight into their activities. The public and private sector usually provide this type of data in both qualitative and quantitative forms, although the former appeared more prevalent. Third, the industry dynamic-related data described how the industry operated, for example company start-ups/closures, infrastructure, value chain, etc., as well as indicating the historical evolution of the industry and the direction in which it was developing, e.g., trends and consumers. The data were both qualitative and quantitative and providers were mainly from (or commissioned by) the public sector, plus academic researchers and trade bodies. Finally, the fourth data category was industry issues, which related to information describing key issues affecting the industry and its development, for example tax credits, diversity, working practices, support needs, cultural aspects, and market trends. Both quantitative and qualitative data were evident and normally provided by industry organisations and public sector bodies. However, market related data including market and consumer-focused profiles and trends were more evident from the private sector organisations.

8.1.2 Data are obtained from five types of sources

The key sources of data used by consultees were: (i) industry-specific research and publications; (ii) government statistics; (iii) personal experience, knowledge and contacts; (iv) confidential company information; and, (v) open data. There was a higher level of reliance on data from personal sources and industry groups. However, consultees made use of all sources, usually combining different sources depending on the purpose to which the data was being put. In general, economic data were obtained from government statistics and industry organisations (e.g., the Scottish Government, DCMS, TIGA), industry issues from industry organisations and the public sector (e.g., NESTA, Ukie, TIGA, Creative Skillset), company information from personal knowledge and industry groups and media (e.g., Ukie, Scottish Games Network, trade press, Scottish Development International) and industry dynamics from personal knowledge and trade organisations. Mention of academic sources was minimal. A few publications were also highlighted as being more regularly used as they focused on specific industry issues such as economic impact, skills and diversity. These included those commissioned by BFI, Creative Skillset, TIGA and the Creative Industries Federation.

8.1.3 Consultees use data for three purposes

Consultees reported using the data for three purposes: (i) to obtain and maintain the consultees' own insight into the industry (i.e., understand the dynamics, improve their knowledge and monitor the industry); (ii) to report on, and anticipate, needs/trends (i.e., project reporting, inform key issues and support needs, and forecasting); and, (iii) to promote the industry and share information (i.e., attract investment, publicity, education, advocacy and member/client support). Consultees drew on all four data types across the range of sources to address their own need. Understanding the user needs, and the data that support this, can help shape data provision and prioritise the improvements required.

8.2 Limitations of the data provision

This project identified that data-related issues did exist, and several limitations were discussed that arose from both data and non-data factors. The data-related factors suggested by consultees were categorised into five issues. First, there were some issues with data access being constrained, resulting in difficulties obtaining certain types of information or an integrated picture of the industry. Second, accuracy issues were evident. Consultees questioned the accuracy of some data sources and tended to use a variety of sources for validation. Factors affecting data accuracy included difficulties in capturing data from small companies, issues with data reporting including self-reporting of SIC codes, issues with timeliness of data and over-reliance on historical data, questions about data validity due to variations in data confidence levels and, finally, the use of data collection methods such as surveys which were not always considered appropriate. The third issue related to the appropriateness of the data sources, with some consultees raising the potential over-reliance on data from trade

bodies/membership organisations, given their industry advocacy role, particularly in relation to the economic data from TIGA, which was regularly used by some consultees and avoided by others. A fourth issue highlighted some concerns about statistical issues, particularly relating to economic data. There were difficulties in capturing data about the companies, a lack of detail, the misallocation of SIC codes by companies and variations in data sources in areas such as employment data. The final issue mentioned by consultees was the limited representation of the industry. Data provision, particularly economic data, provided a narrower perspective of the industry than that experienced by consultees. There was a perception that the breadth and value of the industry was sometimes overlooked, underestimated and misunderstood.

Three industry-related factors were also considered to be issues for data provision. First, the characteristics of the industry made data difficult to capture, particularly in statistical terms. The industry is fragmented, with a high rate of change, a diverse range of participants and activities, a high number of small companies and freelancers and, sometimes, ad hoc networks. Capturing such industry characteristics using statistical data was difficult and, in turn, such data does not represent the industry accurately. Second, the lack of representation from within the industry was felt to be an issue. A lack of leadership and 'industry voice' was mentioned as constraining how effectively the industry could position itself as well as lobby on issues such as data, support and an industry strategy. Some consultees also indicated that there was no evidence to suggest that the industry was interested in data provision. Finally, some consultees were unsure about the importance of the industry and whether the allocation of resources for data provision purposes was appropriate. They also suggested that there was uncertainty around the level of interest from the industry about data. The possible lack of perceived potential about the industry, could have a negative impact on how resources are allocated, including for issues such as data.

8.3 Improvements needed to data provision

The review indicated that improvements to the existing data provision would be beneficial. Consultees, in the main, considered it important to have informed, accurate and consistent data provision as this could support the following activities:

1) Decision-making about the industry's development.
2) Creation of support interventions that are more tailored and resource-efficient.
3) Improved monitoring, evaluation and benchmarking about the industry.
4) Promotion and visibility of the industry.
5) Decision-making by companies about their business case, internal ideas, and awareness of competition and comparators.
6) Advocacy for the industry and its needs.

Improvements to the data provision were suggested in five areas. First, data that more accurately represent the industry. Overall the requirement was for information that

reflects the breadth and depth of the industry and provides more insight into the participants, their activities and the issues that they face; the roles played by different organisations, and game-related activities including game types, platforms and releases. Improvements were suggested across all four data types: economic data could be developed to provide more accurate statistical data about, for example, companies and sole traders; more detailed information was required about the companies themselves and the breadth of organisations within the industry; industry dynamics data could be improved to provide information about company start-up/closure, relationships, networks, freelancer activity and graduate activity/ pipeline; and, further insight into industry issues such as such as diversity, cultural impact, skills and support needs is required. The second improvement was to facilitate access to existing data. While there was a range of data in existence, it was not always perceived as visible or accessible. Better use of new and different approaches to data collection is also important to support better industry engagement in data capture. The third area of improvement related to the development of statistical data to provide data that were timelier, comparable and that more accurately reflect the industry. Although such change was, in the main, viewed as a longer-term issue some developments emerged from discussions between the Government and industry bodies and the new ONS Statistical Business Register is expected to be beneficial in this regard. The fourth area of improvement is to increase industry representation from within. While not a solely data-related issue, having more leadership from within the industry could improve the accuracy of how the industry is portrayed as well as provide a channel through which industry stakeholders could access data. However, this suggested improvement was not universal among consultees, with some disputing the need for changes to representation and questioning the relevance of this in the context of data provision. Finally, there were suggested improvements relating to new datasets and approaches to data. Consultees identified several projects that could provide an opportunity for exploring changes to the data provision. A few big-data-related projects were being undertaken which may have synergy with the games industry and there was interest from consultees concerning progressing discussions about this including Ukie, the BFI, IGDA Scotland, Dundee City Council, the Games Fund, NESTA and Curator Technologies.

8.4 Four options identified for future data provision

Implementing actions to address the project findings was outside of this project's scope. However, to stimulate discussions and support decision-making, four options were generated for consideration. Such options are summarised in Table 8.1.

Table 8-1 Options for a future data provision

Options	Aim and rationale	Key elements
Option A: **Do nothing**	Continue to use existing data.	• Use existing data. • Assumes current data provision is adequate for purpose. • Accept that the industry in Scotland is too small to justify its own data provision or the resources associated with it.
Option B: **Increase the visibility of existing data**	Create a more integrated approach to data, highlighting different data types, sources, publications, etc.	• Establish a focal point for data about Scotland's games industry. • Highlight data sources and contents. • Link to reports and research sources. • Identify potential collaborators including project consultees.

Option C:
Improve data by addressing specific issues and gaps
	Address the limitations of particular data types or themes.	• Prioritise data deficits needing to be addressed in one or all of the following:
		  o economic data
		  o company-specific data
		  o industry dynamics and impact
		  o industry issues
		• Define a strategy for addressing each deficiency.
		• Identify collaborative partners including those consultees with an interest and/or expertise.
		• Increase the visibility of data and access points.

Option D: **Create new data via a different approach**	Adopt a different approach to describing Scotland's games industry, incorporating new data, existing data, partners and data-related technology to provide a more holistic view of the industry.	• Provide a richer, broader and more accurate picture of the industry. • Pilot project drawing on existing interest in games and new data collection methods (including consultees). • Incorporate qualitative and quantitative data. • Link to existing data. • Transfer knowledge post-project to the wider games industry and other sectors.

Having presented the conclusions in this section, the recommendations made as a result of this project are provided next.

9 Recommendations

Scotland's games industry is perceived as making an important contribution to Scotland, other industries and the wider UK industry. This contribution is both in economic and non-economic terms. Given this importance, there is a strong rationale for ensuring that the data provision is relevant, accurate and accessible, in order to support policy-makers, support agencies and industry itself with decision-making and resource allocation. This review of, and consultations about, the data provision that exists has highlighted several weaknesses and generated suggestions about what a future data provision might look like. The key recommendations are now discussed.

9.1 Short term: address specific weaknesses in data provision

The recommendation in the short term is to address the current weaknesses in the data provision. Limitations have been identified in four types of data and across various sources. Of the four options suggested in Section 8, the short-term recommendation is to address specific data-related issues (Option C). There are gaps in all four categories (economic, company-specific, industry dynamics and industry issues), although the economic and company-specific data attracted the most attention from consultees and, therefore, could be prioritised. This option allows work to be undertaken on specific limitations identified in the project, either in relation to a specific type of data or a theme therein. Some illustrative examples of the limitations and suggested improvements are provided in Table 9.1. While, an impact analysis and action plan were not deliverables in this project, as it is stakeholders in any future project that would determine the final specifications and associated actions, a first step towards assessing this option could be the development of an action plan in collaboration with key industry stakeholders and practitioners (including some of the consultees involved in this project) to prioritise and address key deficits. Engagement could incorporate the following:

1) Discuss and evaluate the findings from this project with key industry stakeholders.
2) Ascertain interest from industry including potential collaborators.
3) Identify and prioritise data-related deficits, considering the purpose and impact of the data, access mechanism, and frequency.
4) Agree objectives and outputs.
5) Agree approach to addressing data issues (incorporating collaborative approaches as appropriate).
6) Allocate roles, responsibilities and resources.

An important element of any action to address deficits is to acknowledge the question raised in the project about the level of interest in, and potential involvement of, the industry in Scotland relative to data. Engagement is, therefore, required with industry to examine this perception and better understand the reality of it. The information in this report can be shared with industry practitioners direct and/or via industry organisations such as IGDA Scotland and Ukie.

Table 9-1 Examples of limitations and improvements by data type

Data type	Example of limitation	Example of improvement
Economic	• Data can become quickly out-dated. • Does not capture breadth of the industry. • Issues with recording. • Variations in definitions and data collection approaches. • Data input inaccuracies and constraints, e.g., incorrect SIC codes, limited financial reporting.	• Further review of SIC and SOC codes. • End disparity in definitions and source data between DCMS and SG. • Improve data capture about sole traders and small businesses.
Company-specific	• Can be anecdotal and based on personal perceptions. • Companies not always willing to provide. • Capturing data can be difficult and resource-intensive to collect.	• Company directory. • Company activities, e.g., game types, platforms. • Company information – size, employees, location. • Games-related data (e.g., BFI tax relief achieved for companies in Scotland. • Capture the companies not represented in the statistical sources.
Industry dynamics	• Lack of industry-wide perspective. • Lack of Scotland-specific information. • Limited data on cultural activities and impact.	• Illustrate the value chain activities in Scotland and the practitioners therein (development and non-development). • Incorporate artist game-makers and cultural practitioners. • Identify collectives, hubs and co-working activities. • Start-up activity. • Investments/deals.
Industry issues	• Lack of up-to-date information. • Lack of Scotland-specific information.	• Identify the key industry issues for Scotland. • Collaborate with industry stakeholders on research projects, incorporating a Scotland perspective. • Consider options for providing access to consumer and sales data.

9.2 Engage with existing games and data-related projects

Irrespective of the subsequent decision about data-related activities, it is recommended that further engagement be undertaken with those organisations and projects whose work involves the games industry (or wider creative industries) and new data sources and collection techniques.   Key aspects of this include:

1) Developments in the wider creative industry context about identifying and capturing data, for example innovation and R&D (NESTA), classification and measurement (Scottish Government, DCMS, ONS, Ukie), exports (CIF), economic contribution (BFI) and cultural impact (NESTA).
2) The trend towards more accessible and interactive data, e.g., ONS, Dundee City Council, NESTA.
3) Developments relating to the games industry itself, for example data (e.g., Ukie, BFI, NESTA), advocacy and representation (e.g., BGI, IGDA Scotland) cultural considerations (e.g., NESTA) and academic developments (e.g., the InGAME project at Abertay University).

9.3 Longer term: Consider an industry ecosystem approach

In the longer term, there is an opportunity to take a new approach to data for the games industry in Scotland – one that allows a more integrated view of the industry and is better attuned to the characteristics and changes within the industry (Option D in Table 8.1). This option focuses on considering an ecosystem-type approach to describe the industry more broadly, working with partners, different data types, and data-related technology to gain a better understanding of the industry. Existing projects being undertaken in relation to big data or games or both would be relevant, including those undertaken by consultees in this project such as NESTA, Dundee City Council and Curator Technologies. Key elements of this action could include:

1) A more integrated overview of the industry.
2) A pilot project about data identification and capture in an industry ecosystem.
3) Qualitative and quantitative data.
4) Linkages with organisations involved in games and big data approaches.
5) Transfer knowledge to games-related stakeholders in other parts of the UK and/or to other industries with similar characteristics.

This concludes the recommendations from this project and this report.

Appendix 1. Consultees

The authors thank the following consultees who took the time to participate in this project and share their experiences and ideas:

BAME	Kish Hirani
BAFTA	Beverley McMillan
British Council	Paul Callaghan
British Film Institute	Alex Tosta, Ian Cade
Creative England	Sam Rushton
Creative Scotland	Alastair Evans, Kristina Johansen-Seznec, Morgan Petrie
Cultural Enterprise office	Rachael Brown
Culture Republic	Julie Tait
Curator Technologies	Simon Sprince
DIT	Tony Hughes
Dundee City Council	Alan Dobson
Ekos	Brian McLaren
Elevator	Andy Campbell
Entrepreneurial Scotland	Sandy Kennedy
Games Fund	Paul Durrant
Henderson Loggie	Steve Cartwright
HIE	Iain Hamilton
IGDA Scotland	Malath Abbas
NESTA	Eliza Easton
Northern Ireland Screen	Donal Phillips
ScotlandIS	Svea Miesch
Scottish Development International	Mandy Cooper
Scottish Enterprise	David Hartley, Joyce Matthew
Scottish Games Network	Brian Baglow
Scottish Government	Mairi Longmuir
Skills Development Scotland	David Martin, Colin Mack
Ukie	Luke Hebblethwaite
University of Dundee	James Livesey
University of Hertfordshire	David Tree
We Throw Switches	Andrew Dyce, Craig Fairweather

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documentation of ready-made interactive leisure and entertainment software, such as games software, designed for publication by a different enterprise. A key component part of the software is audio-visual content with which the user interacts. The software can be published across any format, such as games consoles, the internet and mobile phones"). This is included within SIC 62.0: computer programming consultancy and related activities.

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