

The Assemblage of Peripheral Game Development: A Case Study of Dundee

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ABSTRACT

This paper presents an exploratory analysis of a video game development cluster/ecosystem in a relatively peripheral city in Scotland (Dundee). While clusters or ecosystems in the cultural and creative industries are often studied through economic geography or managerial lenses, focusing on agglomeration and formal processes, this paper adopts concepts from Assemblage Theory to explore the complex socio-material relations that constitute a cluster, including its emergence, stabilisation and transformation. Through the qualitative analysis of a corpus of public documents, the paper begins to trace some of the key components that have assembled to form Dundee's video game industrial ecosystem. Findings reveal an assemblage characterised by a sort of bottom-up transformation which is in part driven by industrial legacies of the city, and a constant recombination of expressive and material resources and where it is evident the role of actors (like universities) that connect formal and informal actors. The study contributes to the literature in explaining the peripheral innovation ecosystems of video games and challenging top-down models of cluster/hub understanding.

Keywords

cluster, industry, assemblage, case study, emergent properties

INTRODUCTION

Most cultural and creative industries (CCIs), including video games, tend to be characterised by spatial differences, with activities often concentrated in large urban agglomerations (like capital cities e.g. London, Helsinki or Tokyo) often termed 'clusters' (Plum and Hassink 2014), hubs (Lempel and Germain 2016), or ecosystems (Brydges and Pugh, 2021). Whilst these different terminologies may capture different

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aspects of the phenomenon, they have in common the idea of a grouping of companies and/or organisations in a defined geographical area, specialising in creative products. In this paper we use the term cluster predominantly, but in a loose way just to refer to the presence of this grouping of organisations. Economic geography and management studies have often focused on explaining these clusters through ideas of agglomeration economies, where the co-location of companies seem to generate benefits (Méndez-Ortega and Arauzo-Carod 2020). However, this perspective often presents clusters largely as defined by sets of essential properties which include their economic output, pattern of aggregation, or studios demographics, while underplaying the complex social, historical, and cultural processes of clusters' formation and transformation.

This paper, is part of a broader project examining six video game clusters across Europe, located in secondary (non-capital) cities (<https://www.game-er.eu/>) Specifically, this paper is an exploratory study that examines one such cluster in Dundee, a post-industrial city in Scotland that has developed a games sector despite its small size and peripheral location relative to hubs like London. Dundee is not home to any major platform holder and there is not a dominant presence of multinational publishers acting as central actors. The cluster is rather a grouping of small and medium-sized enterprises (SMEs), with the presence of a university and some other actors (like organisations providing specialised services, other educational institutes). It also has an established culture of informal collaboration. The emergence of Dundee as a video game cluster is not the result of any top-down policy based on e.g. public investment or the location of a major international company, but the results of historical legacies, chance events, and bottom-up initiatives.

Our exploration assesses whether Manuel DeLanda's Assemblage Theory can provide a framework for conceptualising a video game cluster like Dundee, over conceptualisations just focusing on the concentration of companies in a defined geographical area and related economic effects. An assemblage is a whole whose properties emerge from the interactions between its heterogeneous parts, which can be disassembled and reassembled in new configurations without losing their identity (DeLanda 2006). In other words, we analyse the Dundee cluster not as a fixed geographically based entity, but as a historically contingent process of assembly. Our approach in this paper is complementary to game production studies in the tradition of Sotamaa and Švelch (2021). By assessing the applicability of DeLanda's theory in the context of CCIs and clustering dynamics, and examining Dundee through documentary analysis as a historically important city for digital games that has not yet been the subject of such intensive research with these methods, we aim to add to the literature on how digital games are produced.

This paper is structured as follows. First, we review the literature on CCIs and video game clusters/ecosystems. We then introduce Assemblage Theory. The method section details our document-based approach, where the data is a corpus of 181 public documents gathered over several months of work. The method section also provides details on the analysis performed. The results section is organised using the assemblage concept. The discussion provides an interpretation of these findings and

the contributions, stating the assemblage concepts have some merits, but will still need further investigation.

LITERATURE REVIEW: CCI CLUSTERS, ECOSYSTEMS AND VIDEOGAMES

Early perspectives mostly based on economic geography, define CCI clusters as the agglomeration of organisations/companies (e.g. Maskell and Lorenzen 2004). For example, one study defines these agglomerations as “a grouping of similar or linked firms in a defined geographical area” (Vorley 2008). This view tends to be operationalised largely through quantitative methods, to identify statistically significant spatial agglomerations (see Maddah et al. 2023 for a recent study). Other perspectives challenge this spatial view, looking at creative ecosystems including range of actors and processes that go beyond geographic or industry boundaries (see e.g. Jimenez and Zheng 2021). A recent literature review found an increased use of ‘ecological’ language in studies on CCIs clustering (De Bernard et al. 2022). To an extent our work is closer to this second perspective, but it seeks to move away from purely economic/managerial accounts.

In studies relating to the video game industry, this conceptual difference is also present. Klimas et al. (2025) defined a Video Game Industry Ecosystem (VGIE) as a network of actors with diverse roles operating via co-creation. Grandadam et al. (2013) distinguished between a business ecosystem (with a central/anchor firm that captures value) and an ecosystem of innovation (a structure where there is collective value). They emphasised the role of a ‘middleground’ which includes the like of platforms, and events that connect the formal ‘upperground’ (companies, institutions) with the informal ‘underground’ (individuals, creatives). A further perspective (Darchen 2016) argues that agglomerations function less as clusters and more as ‘networked communities’ that rely on social networks rather than just on co-location. Lehtonen et al. (2020) also observed that networking is one of the defining components (or faces) of a cluster. This is supported by findings that companies often rely on local networks for trusted exchange and global networks for specific acquisitions (Chaminade et al. 2021).

When it comes to disciplinary approaches to clusters/hub/ecosystems, it also is clear how disciplines relating to economics and management are dominant, except for very few examples (e.g. Costalunga and Fassone 2025). Some studies in the area of Management and Organisation focus on the investigation of the interrelation of formal structures and informal connections, and knowledge creation (e.g. Rampa et al. 2021), and tend to conceptualise diverse agglomeration models, sort of ideal-types or archetypes, such as: ‘business ecosystems’ (based on centralised leadership) and ‘innovation ecosystems’ (based on distributed leadership) (Cohendet et al. 2021) (see e.g. Plum and Hassink 2014 for another example based on knowledge ideal-types) or ‘faces of ecosystems’ (Lehtonen et al. 2020). Cross-sector cooperation (across diverse CCIs) also is a focus of management studies (Klimas et al. 2025). Studies in Economic Geography instead tend to focus on essential properties relating to spatial agglomeration. For example, researching location patterns (e.g. Darchen 2016) of companies in e.g. metropolitan areas or districts, including using longitudinal perspectives (e.g. Książczyńska 2018), or a comparative focus on geographical aspects of

clustering (e.g. Ernkvist and Ström 2018). There also are limited contributions toward understanding clustering in peripheral areas (Crocata et al. 2025), again with focus on spatial and quantitative patterns.

The literature, as seen, is heavily weighted on management and economics and skewed toward researching large, successful clusters (e.g., Montréal studied by Cohendet et al. 2021; Hamburg studied by Plum and Hassink 2014) or those large clusters that have declined (e.g., Vancouver, Siemiatycki et al. 2016). There is less understanding of the ongoing, everyday processes that constitute the assembly and maintenance of smaller, peripheral clusters. These clusters can be seen as another example of peripheral contexts of game production (Švelch, 2021), where the periphery (as something which is usually seen dependent from the centre, and of lesser importance) can still be a place where important industrial and creative activities take place around games, and where new modes of production unfold. This problem is relevant for secondary clusters that do not present a clear organising actor. For example, without presence of what has been called an 'anchor firm', i.e. a large multinational publisher, like is the case of Ubisoft in Montreal (as in e.g. Rampa et al. 2021 or Cohendet et al. 2018); or a business organisation with direct role in managing collective action and/or representing industry interests (as in e.g. Plum and Hassink 2014). How do such clusters/ecosystems form, transform, and sustain themselves without the central orchestrating force? What is the role of history, chance, and sociality in their assembly? This paper beings to address this problem by providing an analysis of the Dundee cluster, focusing on its historical genesis, socio-material composition and ongoing transformation.

ASSEMBLAGE THEORY

The analysis of clusters/hubs/ecosystems has often focused on internal coherence. Ideal-types and archetypes, in particular, are models that emphasise essential elements of phenomena. However, these approaches are unable to observe the presence of any non-linear development, or emergent properties. For example, it may be possible that the formation of a cluster depends on contingent events, or on the specific roles of one of more of its subparts, not necessarily playing a central anchor role. To address these limitations, we explore the use of Assemblage Theory concepts (DeLanda 2006 and 2016), to study the Dundee case.

Assemblage Theory starts from the notion that social entities are contingent and dynamic wholes emerging from the assembly of heterogeneous components. These components, or parts, can be human (e.g., individual developers, entrepreneurs, policymakers), organisations (e.g., studios, universities), and non-human elements (e.g., infrastructures, technology). Components can be both material, relating to physical and enduring aspects (e.g. physical or functional arrangements), and expressive, relating to symbolic or discursive aspects (e.g., cultural identity, narratives). For example, an organisation may be both material (e.g. located in a physical building) and expressive (e.g. its external reputation). An assemblage does not get defined by its parts or the essential properties of the parts, but emerges from the relations among them. This means that a part (e.g., an experienced developer) can

be detached from one assemblage (for example, a studio) and plugged into another assemblage (a new startup), retaining its own properties while contributing to the emergence of a completely different whole (a new company). This contrasts with approaches based on relations of *interiority*, where parts are defined by their function within the whole (like the role of an anchor firm, or ideal types of knowledge agglomeration) and cannot be understood in isolation. The current state of an assemblage is the result of a unique series of events, decisions, and chance. The history of an assemblage is significant for its current state, as past components and the relations between them leave *material* and *expressive* traces that end up constraining or enabling future assembly possibilities.

The structure of an assemblage is shaped by two processes called territorialization and deterritorialization. Territorialization increases the internal homogeneity of an assemblage, for example defining boundaries and strengthening connections between components. Territorialization may work through codified practices (e.g., regulations), infrastructures (e.g., buildings), established institutions (e.g., local government), or social norms (e.g., work ethics). On the opposite, deterritorialization is something that reduces the homogeneity, by loosening the relations among components, making boundaries less defined or opening-up to new configurations and parts. This can be driven for example, by migration of talent or fewer funding opportunities. Importantly these processes are value-neutral. For example, too much territorialization may block creativity (e.g. relying too much on few selected technologies). On the other hand, deterritorialization may create positive possibilities; for instance, new actors bringing novel methods of work. Territorialization and deterritorialization are also not sequential and happen instead in a sort of dialectical flow. Lastly, an assemblage is composed of smaller sub-assemblages (e.g. individual studios, events) and is itself a component within larger, regional, and global assemblages (e.g. a national games industry). A change at one scale can have effects at another scale, producing territorialization and deterritorialization.

METHOD

This study is based on a qualitative analysis of a broad/diverse corpus (n=181) of publicly available documents relating to the Dundee cluster and, to some extent, to the broader UK video game industry. These documents were collected to obtain a view of the cluster from existing written secondary sources. The list of documents is available in Zenodo (De Paoli et al., 2025b, Dundee spreadsheet) as an open access dataset. For the data collection we adopted a broad scope, gathering material from a diversity of sources, as detailed in Table 1. In later pages these documents will be referenced using the format we used in the dataset, with the letter D (Dundee) and the recording number in the deposited dataset (e.g. [D0019] is the 19th document gathered; [D0121] is the 121st document etc., as reported in Zenodo).

Source Type	Count
Webpage (e.g. city council or university website)	83
News article (local/national)	28

Press releases (e.g. of events)	15
Website (e.g. of companies)	20
Public Report (e.g. on the industry)	11
Report of Session (e.g. parliament)	3
Response to policy	2
Other/Unclassified	15

Table 1: Type of sources/documents collected and number

Data collection was conducted over a five-month period in the second part of 2024, with updates during 2025, including during write up of results. Discovery of sources was primarily conducted via Google search, supplemented by targeted searches of official websites (e.g. UK and Scottish government portals, Creative Scotland, or industry associations). A set of keywords was used, combining terms related to the video game industry (“game development”, “game studios”) with contextual words specific to the case study (“Dundee”, “Scotland”). Boolean operators and filters (e.g., time) were applied to refine results. We adopted a very broad inclusion and exclusion set of criteria for our sample. Indeed, documents were included in our collection if they directly concerned the video game industry in Dundee and provided relevant, factual, organisational, or contextual information for the case study. They had to be publicly accessible sources discovered through the search process and keyword strategy presented just above, unless a document was closed but still could be made available by the authors to the project team. Documents were excluded if they were of limited relevance to the Dundee games ecosystem (e.g. marginal or superficial mention to the cluster, documents with limited insights about the companies or other key actors), lacked reliable information (judged at time of collection), or were purely promotional. Albeit on this last point we need to acknowledge that public documents still tend to portray positive aspects of the local industry and the region, and this may introduce evidently some bias when the documents are analysed. This point will be considered in the discussion of the paper, around the limitations and future steps we will take to triangulate with other types of data.

The initial collection included over 133 documents, subsequently enriched, with an ongoing discovery, to 181. These documents were first checked for relevance and then recorded. A prioritisation process was then undertaken, resulting in the qualitative analysis of 69 key documents, adopting thematic coding. This analysis followed an analytical grid derived from prior project work (see Paris and De Paoli, 2025) as part of the broader research project. Inductive coding was performed initially, after which codes were grouped using categories from the analytical grid, and subsequently linked to concepts of the Assemblage Theory during the writing of this paper. The entire corpus (due to the size/text amount) was also uploaded to an Open-Source Retrieval-Augmented Generation (RAG) solution deployed on a secure server, allowing for supplementary insights extraction. A RAG system allows to use a Large Language Model (LLM) with documents, with the model’s responses remaining

grounded in real source documentary material. With a RAG system it is therefore possible to query a corpus of documents with the support of a LLM, asking for specific insights on the material. We used the RAG system as a complement to the qualitative manual analysis to extract additional information from the documents. The use of a RAG follows recent development in using generativeAI in social sciences research (see e.g. Thapa et al., 2025) and documents analysis (see e.g. Simons et al., 2025; Tykhonov et al., 2025;). Lastly, additional sources were consulted to confirm specific figures (e.g., employee numbers) but were not included in the main database. Academic sources were also consulted but not included in the database, these are cited in the following using the standard referencing.

RESULTS

This section presents the findings of the documentary analysis. These are articulated in two areas, the first around the variable roles of components (material and expressive); the second on the processes of territorialization and deterritorialization.

The Historical Emergence and Genealogy of the Assemblage

The genealogy of the Dundee video game cluster assemblage cannot be subsumed under a single aspect or event. Instead, it does in part emerge from the historical recombination of diverse components. The cluster is the product of a deterritorializing process of components from the declining industrial assemblage of the city (based on manufacturing with legacy industries around textile and shipbuilding, and later electronics manufacturing). At least, in some ways, these components were reterritorialized into a new configuration around video games.

A crucial material component inherited from prior assemblages was the presence of innovative companies and skilled human capital. Significant manufacturing companies like NCR (National Cash Register) and Timex established some kind of diffused technical proficiency in the city, long before the advent of video games. NCR started operating in the city after WW2, producing cash registers. In the 1960s production moved into electronics with ATMs [D0135] and, later, in a context of industrial decline to a dedicated R&D centre [D0134], with manufacturing production ceasing in 2009. This established also what we can think as a durable expressive component: an identity and reputation for Dundee as a site of technical innovation, which still exist today. The Timex factory, which manufactured the ZX Spectrum home computer locally (closing in 1993), materially brought to the city the very technology required for grassroots game development, with home computers becoming widely diffused across the city. Documentary evidence report that this situation created a generation of young individuals curious about using computers: “Dundee was an unusually tech-savvy city for its time in the 1980s” [D0125]. The city is also connected to the expressive legacy of DC Thomson a Dundee publisher, established with newspapers and printed media in 1905 [D0136], that over the years also started producing and publishing iconic comics like *The Beano* and *The Dandy*. Albeit indirectly, being known as an important UK media and creative city [D0137] contributed an expressive component to the city's identity.

The material and expressive components from these diverse pre-existing assemblages (manufacturing, electronics, publishing) were floating in a state of deterritorialization following in some cases industrial decline, ready to be plugged into a new whole.

A first key moment of the cluster assembly was the founding of the company DMA Design in 1988. This event can be seen as a powerful territorialising force, that brought together the deterritorialized components of technical skill and creative talent, into a new entity with a clear purpose: commercial game development. One of the founders of DMA worked for Timex for example. The subsequent material world-wide success of games like *Lemmings* [D0125] (DMA Design, 1991) and *Grand Theft Auto* [D0048] (DMA Design, 1997) by DMA generated for the cluster a new significant expressive component: international reputation. These successes solidified Dundee's initial new identity as a place where leading game development was possible. This also inspired the formation of new material components (new studios started by ex-DMA employees).

In parallel a new component was added to the cluster: Abertay University. The University, based in Dundee had been founded in 1888 as a technical institute providing technical and vocational education for the local industry. In line with this, Abertay established the first ever degree in computer games development in 1997 to respond to the needs of the new local industry (Sutherland, 2018). This was a significant act of expressive and material engineering. Expressively, it legitimised game development as an academic and professional discipline locally, but potentially also more broadly (Sutherland et al., 2002). Materially, the creation of the degree (later becoming several degrees, covering areas such as game development, design, art etc) created a stable flow of skilled human capital, and also absorbed components of the video games industry who became lecturers. Abertay became what we could call a sort of "component-generating machine" for the assemblage, ensuring a constant flow of programmers, artists, designers and over time also studio founders, researchers and so on directly into the local ecosystem, reinforcing its territorialisation.

Our data shows that the cluster assemblage emerged initially as a process of historical recomposition of components, some of which (but not all necessarily) were discussed above. It was not a complete break from the past overall, but a new whole emerging from some pre-existing material and expressive components of Dundee's industrial history and education. The old assemblages of manufacturing, and publishing provided some raw parts like the technical skills, creative traditions, and reputation for creativity and innovation. These were reterritorialised by new components, in particular DMA Design and Abertay into the new, stabilising assemblage of the video game cluster.

The Assemblage's Material-Expressive Structure

Our data illustrates that the Dundee video game cluster-assemblage is today a complex whole comprising diverse material and expressive components. In this section we consider some of these key components and their role, and in later sections we will discuss how these contribute to territorialization and deterritorialization processes.

Key Examples of Material Components

The most significant material components of the assemblage are the local game studios themselves. Official or public statistics (e.g. [D0139] [D0027] or the UK Government map of innovation clusters¹ about studios located in Dundee) tend to be imprecise and patchy, often underestimating the number of studios present. Through

our own analysis of the documents and with support of the local video game development community, via a public call on the Scottish Games Network website² we identified 43 such components, the vast majority of which are small and medium enterprises (SMEs), in some cases start-ups initiated by former Abertay graduates. This wide presence of small studios is a defining material property of the assemblage, directly influencing its innovative capacity, and to an extent also its vulnerability.

A key emergent property relating to this is that most of these studios are highly concentrated in Dundee's city centre. An analysis we performed on postcodes relating to the studio's locations reveals an average distance of circa 500 meters between companies located within the central boundary of the city, (730 meters if we include also the studio located on the outer skirts of the city) (Figure 1). Promotion material sometimes refers to Dundee as a "20-minute games cluster." [D0047], to emphasise this closeness between studios. This geographic proximity is a key material component that enables frequent, and informal interactions consequently reducing costs of collaboration and knowledge exchange. Many studios are also co-located in the same buildings. Indeed, other significant material components include the physical infrastructure dedicated to the cluster. Buildings like the Vision Building [D0142] and the Water's Edge [D0182] facility act as material places that co-locate multiple studios, as well as industry-academia research laboratories and activities, further intensifying interactions [D0130].

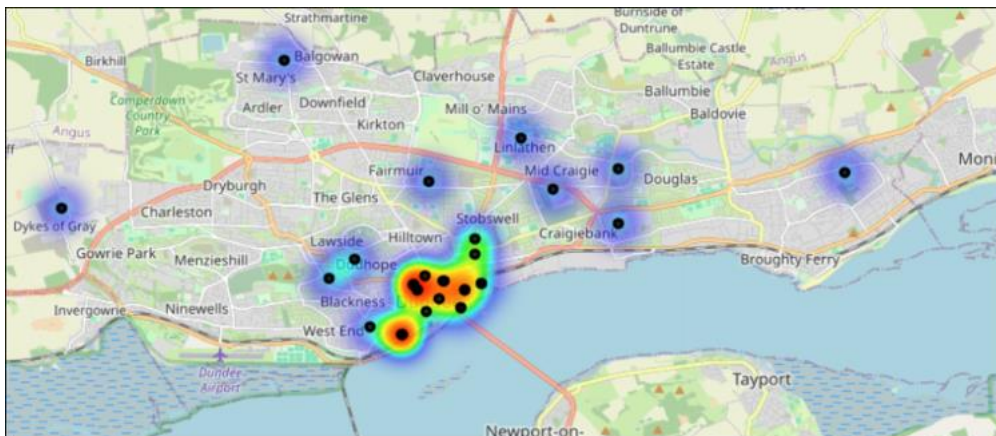


Figure 1: Dundee Companies' location by postcode and relative density (heatmap)

The material flows of capital operate at multiple scales. At a macro level, national public funding schemes like those of the UK Games Fund (UKGF) [D0156] provide support for early-stage companies (both in the form of seed grants, as well as for realising new games). There are clear examples of Dundee studios benefitting from this national funding, toward the generation of new IP (e.g. [D0162] [D0163]). At the local level, Chroma Ventures is an interesting material component for the cluster where capital generated within the cluster is reinvested into it. Chroma Ventures has been founded by the co-founders of 4J Studios (a prominent Dundee studio, owned by local industry veterans) [D0151], and operates as a local investment organisation. Its material actions include targeted investments in Dundee studios like Puny Astronaut and Stormcloud Games (see e.g. [D0152]). Chroma also owns and operates the Water's Edge facilities.

Abertay University remains a key material component providing education and talent (e.g. [D0039]) but also R&D infrastructure and leadership (e.g. [D0025]), testing facilities, event spaces and the organisation of activities to link students with industry (e.g. [D0143]).

Key Examples of Expressive Components

In an assemblage, material components tend to acquire direction and meaning through expressive components, such as narratives, reputations, norms, discourses etc. that shape collective practice and shared identity.

A significant expressive component is the diffused narrative about the city's post-industrial transformation, from (industrial) decline to a city of design and creation. Documentary sources from policy reports [D0071] to press articles [D0074][D0131] consistently frame the video game industry as a central actor in Dundee's reinvention, alongside other elements such as the creation of the V&A Museum of Design, or the development of key areas of the city.

The reputation of the cluster also is an expressive component. This operates simultaneously externally and internally. Externally, Dundee's reputation is for example relying significantly on what we can consider the legacy of DMA and its iconic games *Lemmings* (e.g. [D0119]) or *Grand-Theft Auto* (see e.g. [D0048]). This external reputation is also reinforced by Abertay's national and international standing for video game education (e.g. [D0039]). This reputation attracts new components to the assemblage: attention from the UK Government (like the decision to locate the UK Game Fund to Dundee [D0036] [D0166]), investment from outside the assemblage (e.g., global publishers like Rockstar Games acquiring a local studio, and having the GTA publisher returning to Dundee [D0149]) and talent from other national and international assemblages. Internally, this reputation is a source of cohesion, reinforcing collective identity.

Another expressive component is the informal reciprocity and community support. This is not clearly a formal rule, but a set of shared social norms. It is evidenced, for instance, directly on companies' websites that make explicit reference to Dundee as a close-knit community of game developers (e.g. [D0059]), or by examples of informal, uncertain and unexpected collaborations emerging (e.g. [D0086]) including across games and the arts, or by collaboration between studios and the university also presenting a rather informal tone (e.g. [D0057]). Interestingly, official documents like a report of the "Meeting of the Parliament - Scottish Games Week" from 2023 [D0048] seem to hint that formal business start-up models may not be able to "support the industry in the way that is needed for it to grow". Perhaps therefore because there is some public and official acknowledgment of the limits of formal support, it is here that informal processes do play a role. This is seen in activities where there is established studios mentoring newcomers, sharing advice, and there is co-location of established and new studios in the same space (e.g. [D0035]). Clearly this is also related to the material aspects of the density of relations (where most studios are very close) and the role of buildings (e.g. Vision Building) where multiple studios are located. This expressive component of the informal nature of relations across studios and other organisations acts as a stabilising force (a territorializing force), mitigating risks faced by the many small material components (studios).

An additional expressive component is the 'work-for-hire' business model that several of the studios need often to undertake and that is explicitly mentioned on their websites, including in dedicated sections (e.g. [D0059] [D0052] [D0054] [D0087]). We know from previous interview-based work that this model prioritises financial stability and predictable income (De Paoli et al., 2025a), however at the expense of generating new Intellectual Property (IP). The model influences the distribution of value within the assemblage, often redirecting the added value of game development toward external IP holders. This is sometimes attributed not to a lack of local creativity but to the scarcity of relevant funding [D0125]. In any case, not all the studios in the assemblage adopt this model, but there certainly is a good number of them.

It is important to remark that the relationship between the material and the expressive components is dialectical. For example, the proximity of the studios (a material component) supports the expressive component of informal community. Conversely, the expressive component of the work-for-hire model directly shapes some of the material output of the studios i.e. the games they produce, and so on.

Territorialization and Deterritorialization

The Dundee cluster assemblage undergoes processes of territorialization and deterritorialization. Some elements of these two processes will be discussed in this section.

Examples of Territorialising Processes

Several aspects reinforce the cluster's internal coherence and stability. Perhaps the most significant is the talent flow which is provided by Abertay University. This supplies the assemblage with a stream of human components (fully trained graduates that can enter studios, start-up founders) (e.g. [D0024]). As a university, Abertay clearly has a persistent physical presence too. Unlike things such as money/capital, individual talent, studios who may close or relocate and so on, the university is stable and geographically fixed within the campus buildings, located in proximity of the studios. These facilities territorialize R&D and innovation activities, ensuring that experimental work, graduate training, and industry-academia collaboration are rooted in the city, making them less susceptible to being displaced or rendering the assemblage dependent on other regions. Abertay also coordinates some collective initiatives, in particular around R&D funding (e.g., the £11.5m InGAME project [D0009], the £9m CoSTAR Realtime-Lab [D0130]) with direct involvement of other actors (e.g. local studios, local organisations, national and international companies). Interestingly, one could consider how in the absence of a formal cluster organisation or an anchor firm, the university operates with some kind of informal governance and coordination role. It territorializes coordination by becoming the main applicant for collaborative projects, and industry-academia initiatives. However, it also is clear that the university is connected to other assemblages, entirely unrelated to video games, such as those related to the other degrees it offers, or other local industries.

Another interesting territorialising process is potentially the emerging pattern of spin-offs and talent recycling. An analysis of historical company closures and formations that we performed, based on the collected documents and other public documentary sources, reveals such a pattern: when a studio closes or is acquired (a potential

deterritorializing event), some of its components (e.g. humans), as well as their skills and expertise are often reassembled. For example, the closure of the major studio Realtime Worlds in 2010 (in itself a successor of DMA Design, created by the DMA founders, and a significant company with 150 employees in Dundee working on a AAA title) led to the formation of several new studios (e.g., eeGeo, Ruffian Games) founded by former employees. The same pattern emerges in relation to the closure of some other historical Dundee studios (Visual Science in 2006; VIS Entertainment in 2005), whose employees created other studios, some of which still operate today. There does seem to be a potential process of constant bottom-up reterritorialization of components often through individual initiative, collaboration, rebuilding, closure and recombination. Figure 2 summarises what we have described above.

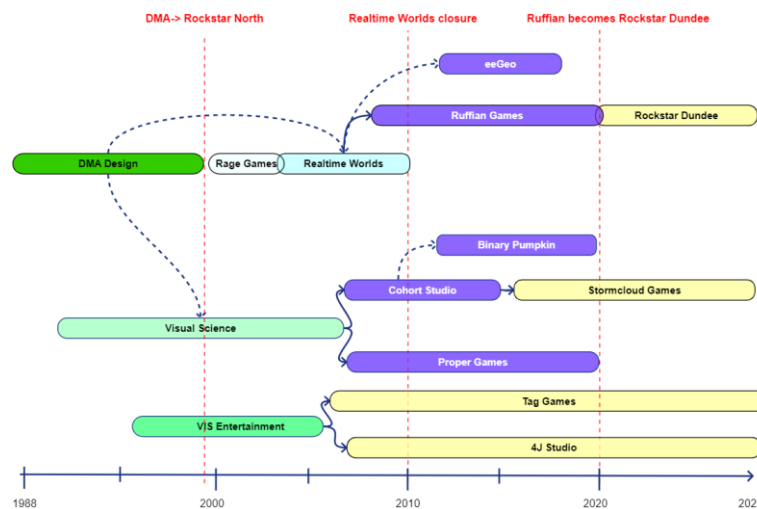


Figure 2: “Historical studios” closure and recombination of components in new studios

Dedicated physical buildings also have a key territorializing role. We have already mentioned the university campus. Other buildings, as material components, play this role. For example, the Vision building and the Water’s Edge development, where there is a co-location of multiple studios, service providers, and also investors. For example, the Vision building is noted to be “home to a diverse mix of businesses creating a dynamic environment where ideas and knowledge can be shared” [D0142]. The assembly of actors in single locations, therefore, may increase unplanned interactions, and create a shared environment.

Examples of Deterritorializing Processes

The cluster also presents processes of deterritorialization. Acquisitions by external entities are a prime example. When a Dundee-based studio is acquired by a global corporation like Take-Two (Dundee studio Ruffian Games becoming Rockstar Dundee) or Scopely (acquiring local studio Tag Games) [D0077], the studio’s objectives and strategies may be recalibrated to align with the global parent’s goals and material components. For example, in the announcement of Scopely acquisition of Tag Games it is stated that “internal Scopely Studios and partner studios benefit from Scopely’s publishing infrastructure, operating system, and proprietary technology platform Playgami™” [D0077]. This may also introduce new expressive components for example

possible renewal of legacy reputation, where according to various sources “Dundee is reportedly once again involved in the development of a Grand Theft Auto game.”[[D0178](#)].

These processes suggest that Dundee’s studios sometimes act as nodes in the strategic expansion of larger assemblages (like large publishers). Through acquisition, parts of the local cluster become rearticulated within global flows, a form of deterritorialization that redistributes agency and resources beyond the city’s immediate control. Yet this movement also opens pathways for reterritorialization, as global firms invest locally, reshape infrastructures, renew reputation and bring new capacities. Another illustrative case is Ninja Kiwi [[D0055](#)], which has progressively expanded its presence in Dundee. After acquiring the Dundee studio Digital Goldfish in 2012 and establishing Ninja Kiwi Europe (maintaining its headquarters in New Zealand), the company was itself acquired in 2021 by Modern Times Group [[D0148](#)] a large Swedish media company. Later, in 2024, Ninja Kiwi Europe acquired Auto Attack Games (a US based studio). This example shows quite clearly various deterritorializing and reterritorializing dynamics that reconfigure the boundaries and composition of the assemblage. Some acquisitions also see a clear deterritorialization of components. An interesting example is that of Chilli Connect, not a video game studio per se, but a company that produced cloud technology allowing developers to add or modify game elements in real time, especially in mobile environments. In 2019 the company (founded just 3 years earlier, as a spin-out of the Dundee studio Tag Games) was acquired by Unity Technologies. One source noted that the technology “will give those who use its game-making engine an easier time managing their games after they launch” [[D0182](#)]. The ChilliConnect technology was therefore deterritorialized from the cluster, and whilst initially Unity maintained an office in the city, this was closed in 2023.

We discussed earlier how studio closures can be seen as reterritorializing processes for the cluster. However, the closure of studios represents a form of deterritorialization too, sometimes happening suddenly and sometimes having lasting effects. This may lead to the dissolving, disappearance or dilution of key components of the assemblage, and the scattering of, for example, human and intellectual capital. We discussed Realtime Worlds closure leading to the formation of new companies. However, this closure also led to a rupture in the cluster’s expressive outlook. The AAA game that Realtime Worlds was making at the time called APB – All Points Bulletin (Realtime Worlds, 2010) was purchased at a fraction of its cost by an American game publisher. The game and the investment made in Dundee thus left the cluster and was deterritorialized elsewhere. APB was also the last major AAA game production to come out of Dundee, an expressive component that also got deterritorialized.

More recently, in 2025, the liquidation of Cobra Mobile is another example of deterritorialization within the cluster. Cobra Mobile was one of the UK’s pioneering mobile studios, operating since 2005. The company had long been an exemplar component for production practices in mobile development. A convergence of adverse events (the death of its chairman, the collapse of clients, and market downturns) however brought to the closing of the company [[D0179](#)]. In assemblage terms, the company’s territorial stability was undone by a series of events converging

by chance. This example of deterritorialization signals that even long-standing and reputable studios are vulnerable.

Further examples of deterritorialization and territorialization will be discussed in the next section.

The Cluster Assemblage and the relations with other broader assemblages

The Dundee cluster assemblage does not exist in isolation, it is always part of other assemblages, which may be operating at different scales. Some elements of this were discussed earlier. However, what needs to be addressed here is that the cluster assemblage capacities and limitations are almost inevitably influenced by these relations, but the cluster assemblage also has the strength to influence other assemblages.

At the most immediate level, the cluster interacts and is part of the wider city of Dundee assemblage. The cluster is at the same time an outcome and a driver of the city's post-industrial change, that some local/national news sources even call a 'reinvention' [D0180] [D0181], from the decline of manufacturing to a new image based on "design and culture" [D0047]. The city assemblage provides material components such as transport, and broader cultural infrastructure (e.g., a UNESCO City of Design designation). Expressively, the city's 'reinvention' benefits from the cluster's innovative reputation, while the cluster benefits from the city's renewed cultural capital. However, tensions may also exist in this relation. The cluster's need for affordable studio space, must compete with other city priorities, such as public space renovation or larger businesses that can pay the standard rent rates (as reported in e.g. [D0086]).

At the regional/national scale, the cluster interacts with the Scottish policy assemblage. This relationship has historically been characterised by a degree of deterritorialization in what documentary sources refer to a lack of coordinated support with a "patchy", "misaligned" and "fragmented" understanding of the sector's needs at the government level (e.g. [D0023] [D0167]). However, a reterritorialization process is underway with the development of Scotland's first National Games Strategy, led by Scottish Games Network [D0044] for the Scottish Government. This aims to create more effective policies to support the sector, which would also have effects on Dundee.

The cluster also interacts with UK-wide assemblages. For example, the UK Games Fund (UKGF). UKGF, a UK-wide government initiative to support the video game sector across the country, has its operational base in Dundee. The location in Dundee has an expressive role for the cluster. Dundee is described in UKGF documents as "a network of experienced founders and set in an established creative community." [D0036]. There is indeed a broader national narrative (e.g. [D0166]) that Dundee is a clear case of how peripheral UK places can thrive and innovate, and that the national governments are seeking to support these areas more. For example, Dundee and the video games industry is explicitly mentioned in the UK Industrial Strategy (UK Government, 2025). The location of initiatives relating to UKGF therefore contributes to the reputation of the cluster expressive component, as if Dundee is an example of many other similar places that the government seeks to support. Moreover, that

initiative provides a material link to national financial resources that local studios can receive (see e.g. [D0162]). UKGF activities provide both material (funding) and expressive (mentorship, training) resources [D0035] [D0161]. These initiative support graduates and studios, for example guiding them towards sustainable business models or supporting the generation of new IP and thus increasing the assemblage's overall consolidation.

DISCUSSION AND CONCLUSION

This paper presented an exploratory investigation of a video game cluster/ecosystem through documentary analysis, moving beyond narratives often presented in traditional economic or management-oriented cluster studies. The exploration consisted in testing whether concepts from Assemblage Theory could support investigating contingent and non-linear processes of transformation. We did not seek to impose a rigid theoretical framework but instead used assemblage concepts to allow the empirical material to reveal the cluster's emerging properties. The work focused on the case study of Dundee (based on analysis of public documentary sources), a rather peripheral city in Scotland where there is a thriving games industry.

The primary contribution of this work lies in its mapping of the cluster's composition, historical trajectory, and coordination activities as assemblage formation. A key theoretical contribution of this analysis is moving away from conceptualising the cluster as a static, bounded entity (even if it has layers), often captured by ideal-types, archetypes, taxonomies or similar conceptual forms. The documentary analysis showed how the cluster could be conceptualised as a contingent gathering of diverse components, playing both material and expressive roles and whose interactions produce emergent effects. This study is part of a broader project studying six regional/peripheral clusters, and the insights we derived from our investigation on Dundee alone have the potential to be further applied to the other project clusters. For example, for understanding whether the relative geographical density of companies in a cluster has any effect on collaborations or joint ventures, or for understanding how expressive components, including of historical nature, influence the cluster organisation and identity. Indeed, one of the forthcoming tasks of our research will be to perform a comparative analysis also involving the European videogame clusters of Brno, Lyon, Turin, Bourdeaux and Fundão.

Unlike many studies that focus solely on economic metrics or management processes, our analysis places strong emphasis on the role of historical legacy, chance events, or combination and recombination of components in a non-linear fashion, shaping transformation. Indeed, the emergence of the Dundee cluster cannot be understood just as a result of market forces, top-down roles of anchor firms, or other layers of activities or policy intervention alone. Instead, it emerges from traces left by earlier industrial legacies which established a local culture of technical proficiency and innovation. These components were later activated by key actors including Abertay University's establishment of the first games degree in 1997, and the commercial success of DMA Design. The paper thus shows how cluster genesis is often a product of historical contingency rather than explicit design.

A second contribution is the examination of the cluster structure (largely based on SMEs) considering the constant territorialization and deterritorialization of material and expressive components. The analysis revealed a fluid transformation characterised by company births, closures, and spin-offs. A studio closure does not necessarily lead to decline, instead, talent and knowledge often recycle into new initiatives. This pattern of assembly and disassembly is an interesting finding that highlights how a cluster is an emergent entity rather than a fixed set of properties. The “20-minute cluster” concept also shows how informal coordination is an emergent property of the cluster demography, where close proximity allows informal collaboration. Territorialization and deterritorialization also appear in relation to expressive components. A significant example is the cluster reputation. Originally part of this emerged via the success of games such as *Lemmings* and *GTA*, this reputation is also an historical trace that gets reassembled and disassembled in various forms. These early successes create cohesion and provide a common narrative. This reputation is also reassembled when novel components arrive, such as the return of Rockstar to Dundee.

The use of a broad document corpus, including policy reports, news articles, company webpages, and press releases, enabled an understanding of the cluster assemblage. However, we need to be aware that documents like those used in this research can introduce a certain degree of bias, as they often highlight the more positive aspects of local development, innovation, and success. Many of these materials are indeed intended to showcase the cluster, companies or the city strengths, and the impact of e.g. public funding. We are aware that documents therefore may overlook some of the difficulties and challenges. In our analysis, however, we have tried to bring these challenges and contradictions to the surface and linked them directly to the assemblage concepts. Further work will be performed later connecting other sources of data (interviews, and historical documents, which have now been collected) to the assemblage concepts. Indeed, as part of the GAME-ER project, in relation to the Dundee cluster alone, we conducted 43 qualitative interviews with key actors (e.g. company leaders, industry workers, academics, representatives of service organisations), and also collected several additional historical documents from local archives. Data triangulation will allow to better formalise the insights we developed here in relation to the concept of assemblage. However, this paper has illustrated that the approach of adopting the assemblage concepts for understanding a local videogame industry is feasible, and future publications will seek to better triangulate the documentary evidence with the other data.

AI Use Statement: The research, and intellectual contributions in this paper are entirely of the authors from the project GAME-ER and a related deliverable. GenerativeAI tools were used to assist with structuring the writing process and through a RAG system. Open-source Large Language Models were used on a local machine. All substantive content, data collection, analysis, interpretations, and conclusions were developed by the authors.

Data Availability Statement: The data underpinning this research (in the form of documents URLs) is Open-Access and available in Zenodo (see De Paoli et al., 2025b).

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ENDNOTES

¹ <https://www.innovationclusters.dsit.gov.uk/>

² <https://scottishgames.net/2025/09/19/game-er-project-calls-for-help-dundee-games-map/>