The Game Boys' Network.

A Network Analysis of the German Digital Games Industry.

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ABSTRACT

This paper aims to map the German digital games industry. Using expert interviews and social network analysis, the current paper focuses on the industry development in Germany, identifying structures of organizational and personal networks in the digital games industry. Following a holistic approach, it is argued that while actors of the standard value chain are key units in the digital games industry, stakeholders who influence the political and social discourse have to be taken into account as well. The results show, that not only console manufactures have an outstanding role in the German digital games industry. Considering in-degree and eigenvector centrality, trade associations (e.g. GAME, BIU) and political organizations (e.g. USK, KJM) are well connected and consequently important actors too.

Keywords

digital games industry, network analysis, expert interviews, games market

Acknowledgement

INTRODUCTION AND RESEARCH INTEREST

Over the past decade, the digital games industry has continued to flourish sustainably. According to a report by PricewaterhouseCoopers, videogame software and hardware is one of the segments with the strongest growth rates in the entertainment industry (PricewaterhouseCoopers, 2009a: 94). Another report by the same company (2009b) expects the global market for digital games to reach more than 73.5 Billion Dollars by 2013. The economic growth has been fast, and organizational structures in the digital games industry have had to adapt to an explosion in size and complexity. The early days of 'garage production' are mostly over, with large studios employing hundreds, in a few cases (like Electronic Arts or Ubisoft) even thousands of people. While professionalization and organizational structure building seem to be inevitable evolutionary steps in the light of rapid expansion, it is most likely that there are still some underlying personal structures that date back to the earlier days of development where business just consisted of a very limited number of people. Some studies show that the digital games industry itself is currently characterized by multiple cooperations and a number of networks (e.g. Müller-Lietzkow, 2006). In some ways, the current situation mirrors some earlier stages of the development of the movie industry, most notably, the emergence of the 'studio system' with emerging structures, but no fixed state of the industry and its key units. In this context Turtle Entertainment states: "The games market itself has become more professional in the last ten years and the games productions can already be compared with Hollywood productions where millions of Euros are spent for one film."[1]

There are already a number of interesting academic works that focus on the digital games industry and its internal structures. Some attention has been paid to industrial organization models (see e.g. Teipen, 2008) or data about the growth of the digital games market. Johns (2006) also conducted an analysis of the structure and dynamics of the digital games industry. "By using a GPN framework to understand how the industry operates and how it is driven" (ibid: 176), the study focuses exclusively on the digital games production network, though. Peltoniemi (2009) analyzed the dynamics of the games industry by applying the industry life-cycle theory and describes the evolution of the games industry from an economic point of view. In short, empirical research on the general structure of the digital games industry is still largely lacking, despite the economic importance of the field. We consider this to be a serious research desideratum, as the fascinating interplay of personal and professional/organizational networks in the digital games industry is not only of importance to the knowledge of the specific field, but can also serve as a more general example for the analysis of organizational structure building in an (still) evolving industry.

We propose to close this research gap by undertaking dedicated socio-economic analyses, based on guided expert interviews with industry key actors and subsequent network analyses, in order to reconstruct the underlying structures and identify signs of change and structural evolution. More specifically, our research interest lies in the actors, their interconnections, and the questions whether we are able to identify one or more networks that form the industry both on a meso (organization) and micro (personal) level.

For the actual research project, we had to limit the analysis to a specific (national) market, mostly out of research practical reasons – a full reconstruction of the worldwide digital games industry through guided expert interviews with the key units is most likely beyond

the possibilities of academic research. The games market being analyzed is Germany – one of the world's biggest markets in Europe and also worldwide. The current paper will focus on the industry development in Germany, identifying the current structures in the digital games industry, referring to organizational and personal connections. As the analysis is based on some considerations that stem from organizational theory, we first discuss the respective literature (section 2), then propose a research methodology to analyze the industry networks (section 3), and finally, discuss the findings of this study (section 4) and present future research paths based on this analysis (section 5).

LITERATURE REVIEW AND THEORY DEVELOPMENT

As described above, we are interested in the structure of the digital games industry and the underlying organizational and personal networks. Naturally, such a network perspective is directly linked to the complex field of organizational studies (for a brief overlook e.g.: Kieser, 2006; Tsoukas, 2005) which has a long tradition in economic and social sciences. As Preisendörfer (2008) points out, the focus of this research area is (a) the systematic analysis of organizational structures and processes and (b) the explanation of procedures in and around organizations (ibid: 12 et seq.).

The identification of organizations depends also largely on the concepts used to define organizations in the first place, as there are many different approaches. Based on our initial premises (s. section 1), we choose an argumentation close to the network analysis. Coming from this school of thought, Scott describes organizations as rational, natural or exposed systems (Scott, 1992). Following this position, rational systems can be described as organizations which are determined by formal social structures to seek specific goals (ibid: 29). From the natural system perspective, organizations are renowned as collectivities that evolve via collective interests and informal activities ensuring the survival of the system (ibid: 52). The open or exposed systems approach, as an addition to rational and natural systems, conceptualizes organizations as lightly coupled systems. According to this view, Scott states that many environmental influences affect open systems (ibid: 83). As Scott contributes a theoretical framework of what organizations 'are', Donges (2008) describes the elements of organizations on the basis of "four answers with an increasing degree of abstraction: of people, actions, social relationships or communication" (ibid: 60). In the first case, organizations can be described as networks consisting of human beings. The second answer characterizes organizations as the members' actions. Thirdly, organizations are built on the members' relationships, and the last approach views organizations as communication.

However, it needs to be noted that Scott's model and Donges' suggestion for the description of organizations are quite analytical. Most organizations do not function as tightly organized systems. To explore how the digital games industry is interconnected, we taken Weick's model of organizing (1969) into account. As he indicates, the actions are reconstructed through the eyes and perceptions of the organization's members and also through the perceptions of third parties. These reconstructions can be seen as 'sense-making' (ibid: 136) processes that, in essence, also define what organizations and industries 'are'. According to him and on the basis of Donges' definition, in this paper we define organizations as systems of members' (inter)actions.

In this context, interconnections will be (a) generated – and reflected upon - by the *members of industry organizations*. As a result, consequently members of an organization will give us their construction of which actions and relations are relevant. Szyszka notes that member's statements automatically represent the interest of the organization (Szyszka 2005: 318), whether they are "formal" or "informal" organizational communicators (the former being members of the management level or the PR department, while the others are just members of the organization).

Furthermore, (b) *third parties* have a different interest in the respective field, and they might reflect upon the industrial structures in an alternative way, due to their specific interests. For example, political decision makers are not doing business with actors from the digital games industry, but have an interest in the regulation of the respective social and economic field. Some social groups might have their own viewpoint, like members of organized 'game addiction victims', e-sports groups etc. Accordingly, there are different types of (inter)actions within the larger field of gaming, so the content of the relations might differ as well as the reflection of different groups of people on these relations and interactions.

Following this line of argumentation, industry networks consist of different types of connections and interactions of various groups of industry members and third parties with an interest in the field (stakeholders). Building upon our initial research interest, we therefore ask the following research questions, aiming at this type of network:

1. Which key units can be identified within the German digital games industry, both in (a) industry organizations and (b) interested third parties?
2. How are these key units interconnected?
3. Can we identify changes in the network, as reflected upon by the network's members?

The first two questions can be answered by focusing on the status quo of cooperation networks and organizational relations. The third question refers to a temporal perspective, since the industry is still in constant change (as noted above).

A question like this calls for a longitudinal approach. However, it is very difficult to retrospectively re-construct temporal data. One possible solution – besides realizing a full longitudinal study – is the analysis of past networks through the memories of the network members. Constant change also means that actors in the digital games industry tend to change their jobs frequently, leading to 'corporate interlocks'. "An interlock is a social relation created by a multiple director, a person who sits on two or more company boards" (Scott, 1990). Corporate interlocks and interlocking directorships are a common research topic of network analysis (for a brief and critical overlook Mizruchi, 1996).

In our study we use a modified concept of corporate interlocks. Besides looking at the cooperation networks of the actors, we are looking to identify a potential of a network structure emerging through the working appointments in different companies, past or present. "Interlocks occur between organizations, but they are created by individuals" (Mizruchi, 1996: 277), therefore we are interested in the career biographies of our respondents, including their current and as well as past organizational membership (thus giving the analysis a longitudinal character, as noted above). We assume that frequent change of jobs

might build networks among companies in the digital games industry, because the actors tend to cooperate with actors and companies they know.

In short: Yesterday's network will influence today's network, which will in turn influence tomorrow's network.

METHOD AND SAMPLE

In order to answer the research questions above, we conducted 41 guided expert interviews with a wide range of stakeholders and members of the German digital games industry. Referring to Flick (2009: 166) we define those persons as experts, who have a specific knowledge and experience in a certain field. It is quite typical for the digital games industry that men are in the management level, so all in all we interviewed 37 men and 4 women. In order to outline the environment of gaming in Germany, we asked questions about the general political and economic frames of gaming in the country, as well as questions regarding industry structures and processes.

In this paper we present the results of a network analysis that is based on the answers of leading representatives regarding their most important collaborators and contacts in the field of digital games.[2] The interviews were conducted from August to November 2010 and the data obtained was transcribed verbatim until January 2011. All computations were completed with R and the igraph package (see Csardi, 2010).

Following qualitative research standards, we used the typical-case sampling method to identify key units in each industry sector (s. also section 2.2).[3] Therefore, the term 'key units' used in this paper refers to the leading organizations and institutions, industrial companies or political organizations which we want to identify. Based on the argumentation of Szyszka (2005), we decided to interview persons at the management level and, in some cases, even press officers, as they can (better) evaluate external business contacts than people in production and lower levels of the organization (Szyszka 2005: 318) – despite concerns that management and PR people will favorably color the performance of their own organization (which was not in the focus of our study). For a better understanding we will call the interviewees 'actors' or 'stakeholders' to clarify that these persons represent the key units.

In a first step we categorized nine "core" segments of the industry in order to identify relevant key units of the German digital games industry that are typical for these segments (see Graph 1). On the one hand, these segments are based on the economic value chain (Porter, 1990). On the other hand, with respect to a more holistic approach, we also included the most important stakeholders who influence the political and social discourse of the German digital games industry. Hence, by combining both perspectives, we are able to describe the German digital games industry from multiple angles in order to get the 'full picture'.

On the basis of the standard *value chain*, we identified six important segments: console manufactures, developers, publishers, browser-game companies (as their production and business model is different from traditional developers/publishers/distributors), online gaming portals and distributors. The world market of console-platforms is determined by three manufactures: Microsoft, Sony and Nintendo, (so all of them) are identified as

stakeholders in our analysis. As these companies did not agree on interviews, this segment is shown in light grey to mirror this lack of in-depth information; however, we could obtain interviews from all other core sections in this analysis. The selection criteria for developers and publishers are the ranking reports of the Top 50 developers (Game Developer: 2009a), respectively Top 20 publishers (Game Developer: 2009b).[4] With respect to the growing segment of browser games, we interviewed four large browser game developers based in Germany, namely Travian Games, Gameforge, Bigpoint and InnoGames. However, because most digital games are still offered at retail (Wirtz, 2011: 631), we also included "traditional" distributors who have agreements with big publishers like Square Enix, f+f distribution, flashpoint and rondomedia marketing.

As noted above, we included three more segments on the basis of a holistic approach of the industry (being more than just steps in a value chain). As legal regulations are crucial to the development of the digital games industry – especially in Germany, where youth protection is enforced by rather strict regulations – we interviewed stakeholders from main political organizations and important societal institutions (according to the German legal system). Interviews were conducted with actors at BPjM, KJM, USK, FSM, (with) media authorities and politicians from several parties. Finally, we included trade associations like BIU and GAME, as they also represent the industry at large.
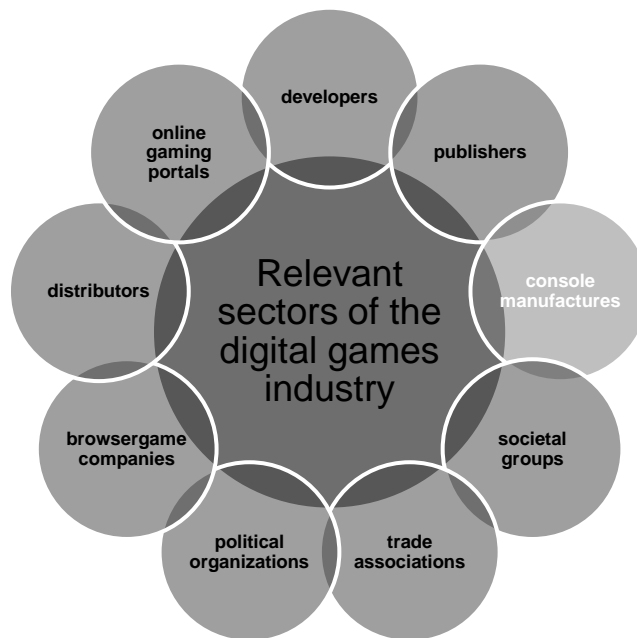
Graph 1: Relevant sectors of the German digital games industry in the analysis; own chart (console manufactures couldn't acquire for an interview).

After this theoretical segmentation of the digital games industry we chose 41 key units, respectively actors, which are typical for one of the eight segments. As based on the results of the network questions, the interviewees also named relations to actors not belonging to the described 'core' industry segments. Thus, we needed to extend the list of the sectors in order to classify the whole network. Therefore and as shown in Table 1, we defined nine additional sectors. Sector 1-8 are the pre-defined core sectors where the respective companies of our interviewees belong to. The other sectors 10-17 are the result of the

classification alteri. Consequently the basis of the network analysis consists of 17 segments.

sector	code
developers	1
publishers	2
trade associations	3
political actors	4
distributors	5
societal institutions	6
online gaming portals	7
browsergame companies	8
journal/publishing	10
payment systems	11
universities/academies	12
graphics and animations sector	13
hardware manufacturers	14
broadcasting corporations	15
film- and sound production	16
marketing, consulting	17
others	99

Table 1: 17 sectors of the German digital games industry; based on the theoretical segmentation (grey-colored) and the sectors named by the interviewees

RESULTS

General Contact Network

In order to get an overview of the actor network of the German digital games industry, we mapped the general contact network of our respondents (Graph 2).[5] This network is based on data from the 41 respondents (egos). It includes 217 vertices. Therefore, 176 new persons (alteri) were added on the basis of the interviews with the egos. Our interviewees named four new persons on average. Altogether, there are 384 relations between the ac-

tors. The mean in- and out-degree in this network is 1.77. That is, various new actors were named as business contacts just by one of our respondents. This alteri are therefore important business partners for just one organizational unit.

The network graph depicts the industry network structure as a whole. The actors are classified based on the sector they work in (see Table 1).
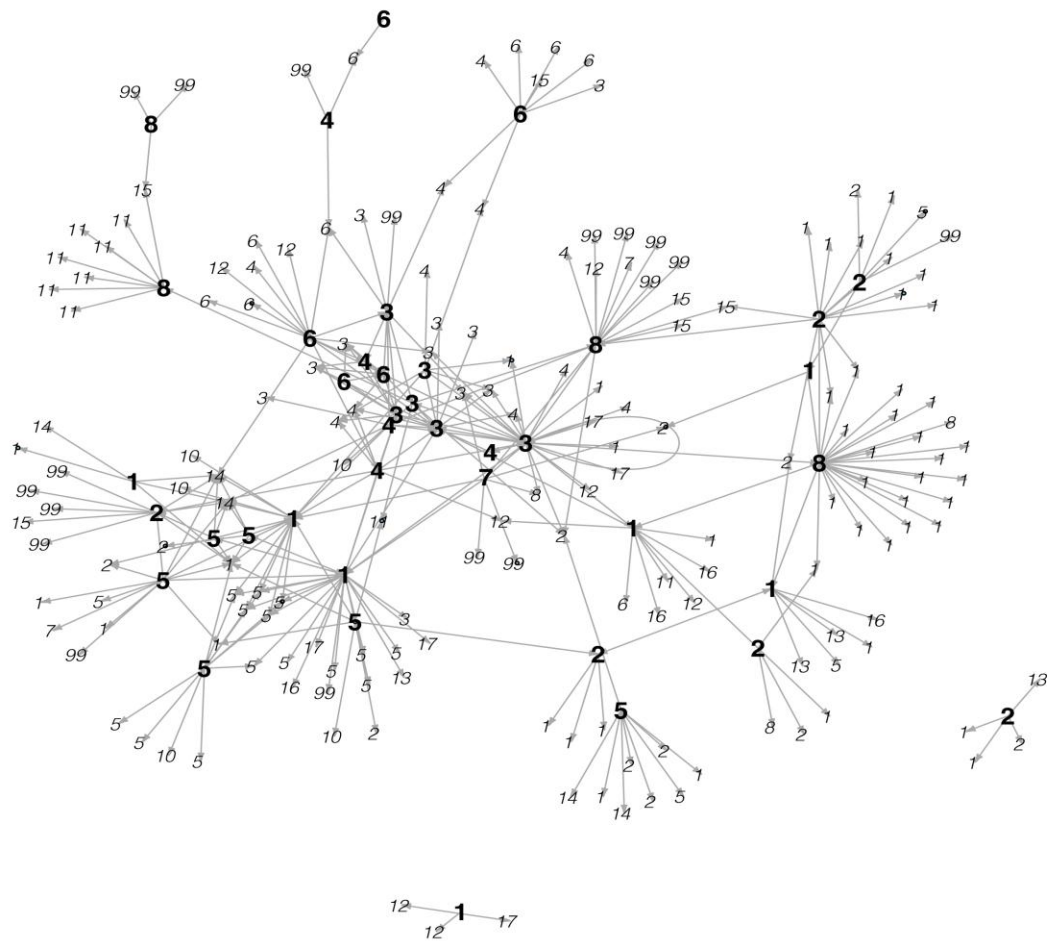
Graph 2: Full network with all 217 actors, divided into sectors. The egos are highlighted in bold.

Due to the form of the data collection, our interviewees appear to be the central hubs in the network. As mentioned above, we chose the central actors out of theoretical considerations. However, it is important to realize that this is also an artifact of the ego based network collection.

Despite this artifact of the ego based network generation, it is evident that new actors are important as well and some of our interviewees' roles do not seem as significant as expected. A large number of actors were even named just once. As our core interest is the identification of central actors, we will be looking at the most connected actors in the next step.

Most Connected Actors Network

We reduced the network by eliminating all actors who had an out-degree of 0 and an in-degree < 2 in order to get a better impression of the important actors. Hence, persons who named no contacts and who were named just once were excluded from the network. On this basis, we were able to identify the most embedded actors in our network (which are, in this sense, the most 'important' organizational units for the industry). The new network consists of 87 actors and 254 relations.

Network description

Graph 3 shows the structure of the new network. The mean in- and out-degree in this network is 2.92. This means that our interviewees named an average of three new people or were named on average by three people from the new network. Naturally, this degree is higher than in the first network, as we considered just highly connected persons this time.

Graph 3: Network with the most important actors, 87 actors. The egos are highlighted in bold.

The network reveals that actors from specific sectors work closely together with other organizational units from the same sector. A closer inspection of the data (s. Table 2 for the respective connectivity matrix) reveals which sector is related to which other sector the most. Rows represent interviewees, divided into the respective sectors. The columns represent the actors they named.

	1	2	3	4	5	6	8	11	12	14	15
1	8	23	13	-	33	-	-	-	8	15	-
2	56	13	-	-	-	-	6	-	-	19	6
3	9	4	43	21	-	9	13	2	-	-	-
4	14	3	61	6	-	8	3	-	3	3	-
5	40	25	-	-	16	-	-	2	-	16	-
6	-	-	44	22	-	25	-	-	-	3	6
7	29	14	29	-	-	-	29	-	-	-	-
8	77	9	-	-	-	-	-	-	-	-	14

Table 2: Sector connection based on the network of the most important actors. Values are rounded, row percentages. Cells with most frequent contacts are colored in light blue. Connections to the same sector are colored yellow. N=87

Focusing the importance of connections inside a sector, we can state that trade associations (3) and societal institutions (6) refer to their own sector most frequently. This is due to the mere fact that trade associations are presenters of the digital games industry. They work closely together because cooperation's with other trade associations are helpful to seek the digital games industry in the whole entertainment market. The strong connection of the societal institutions can be explained by the German regulation system: There is a need for this group to work together. Also, publishers (2) and distributors (5) are quite connected inside their own sector. In the first instance this findings seems to be inconsistent, but in consideration of our choice of actors it is getting evident, that these results are based on the sample selection.[6] As all of the publishers are specialized in different types of games (e.g. gamigo publishes online games), these actors are not competitors as such, so we can assume that they communicate and are well connected. Developers (1) and political actors (4) are not very much connected in their own sector. In respect to political actors this is on the one hand a consequence of party oriented politics. On the other hand this can be an indication for the lack of games specific regulations and that just few politicians in Germany are dealing with this topic. Developers seem to be mainly concurrent and are therefore not much connected inside their sector. The number of cases for each sector are quite low (see Table 5 in the appendix) therefore our results are just suited to show certain trends.

In the second step, we focus on the most important contact partners of all sectors. Developers (1) are among the most frequent contact partners of four other sectors. So we can state that they have an outstanding role in the the digital games industry. Also trade associations (3) play a significant role; they are most important for three sectors. As lobbyism is essential in the whole digital games industry, connections with trade associations are in the interest of all actors. Particularly political actors (4), societal institutions (6) and online gaming portals (7) are working together with them closely. It might be that political actors and societal institutions are negotiating with them as well, because of new regulations and restrictions. Online gaming portals have three important partners: trade associations (3), browsergame companies (16) and developers. This is due to the fact that online gaming portals have the role of distributers for browsergames and are first of all in the need for 1) products and 2) lobbyism. Distributors (5) are the most important partners for developer. All of these results are consistent with the traditional value chain, whereby some of these connections can be explained.

However, not all sectors are connected, distributors (5) and political actors for example. Distributors (5) are either connected with trade associations (3) so this means that lobbying and political regulations are not in their core interest. They focus on business and therefore on developers (1). Same works for publishers (2). They play a very little role as contact partners for political actors, trade associations or societal institutions as contact partners. Concentrating on business, publisher's main contact partners are developers (1).

Centrality

As noted in our research questions, one central goal of this study is the identification of the most important actors in the German digital games industry. In order to do so, we use the concept of actor centrality here (s. Wasserman & Faust, 1994). The calculations are based on the most important actors' network (graph 3, s. section 4.2.1). Knowing that there are different concepts of centrality, we chose in- and out-degree based centrality and eigenvector centrality[7] for this paper assuming that these concepts fit most to our research questions. The in-degree centrality is easy to interpret: these are the actors who were named most by other actors. Therefore, they are the most important cooperation partners for our respondents. Eigenvector centrality is measuring a vertices' network importance, because it gives greater weight to a node the more it is connected to other highly connected nodes. A node connected to high-scoring nodes has a higher eigenvector centrality than a node connected to low-scoring nodes. In other words: It does not only matter that actors have a lot of business contacts, but that they have highly connected, 'prominent' contacts. Normally, eigenvector centrality is calculated for undirected networks, assuming that no matter which direction the relation has, there is a kind of connection. The out-degree is therefore counting for this centrality measurement as well (problems of the out-degree, see footnote 7). Nevertheless, it is be helpful to compare the different scores to be able to estimate the overall situation. Table 3 lists the 10 most important actors according to different centrality measures.

	In-degree	Out-degree	Eigenvector centrality
1	GAME (15)	Gameforge (18)	GAME (1,0)
2	Nintendo (14)	GAME (15)	BIU (0,67)
3	Microsoft (13)	CDU (15)	USK (0,60)
4	BIU (12)	Flashpoint (14)	Ubisoft (0,56)
5	EA (11)	Square (13)	CDU (0,51)
6	USK (10)	LfK (12)	KJM (0,48)
7	KJM (8)	Ubisoft (11)	EA (0,44)
8	Sony (7)	EA (10)	Gruenen (0,42)
9	Ubisoft (6)	USK (10)	Turtle (0,33)
10	FSK (6)	BPjM (10)	LfK (0,33)

Table 3: The 10 actors with the highest in- and out-degree and the highest eigenvector centrality (undirected) in our network. N=87

Based on our analysis, GAME is the most central actor scoring very high regarding all three centrality concepts. GAME is a trade association doing lobbyism for companies in the digital games industry. It is therefore evident that GAME is connected not just with the companies but as well with political organizations. Other important actors (considering in-degree and eigenvector centrality) are BIU, EA, USK, KJM and Ubisoft. BIU is a trade association like GAME, and therefore well connected, too. USK and KJM are societal institutions and, as explained above, they need to work together with a lot of other actors. Ubisoft and EA are two of the biggest developers in Germany. It is noticeable that Nintendo and Microsoft score very high in terms of in-degree-centrality but not in eigenvector centrality. This is most likely an effect of these companies not being included in our interviews, as the eigenvector centrality is taking the out-degree (undirected) into account.

However, as the current study is part of a longitudinal study (with interviews being conducted every subsequent year), we can use the centrality measures to define actors we should interview in our next study. In this sense, the calculation of the various indices is helpful to implement a longitudinal study learning from its past finding. However, we can already identify actors who have a high in-degree and/or a high eigenvector centrality as the most central ones for the digital games industry in Germany.

In the second step, we will focus on the most central sectors in the German digital games industry.

sector	1	2	3	4	5	6	11	12	12	14	15	8
in-degree (mean)	3,44	2,38	5,73	1,9	1,69	1,88	2	2	-	10	2	2
out-degree (mean)	2,17	1,23	4,27	3,6	4,23	4	-	-	7	-	-	4
Eigenvector-centrality (mean)	0,11	0,05	0,37	0,21	0,13	0,15	0,05	0,05	0,32	0,21	0,02	0,13

Table 4: The sectors with the highest in- and out-degree (directed) and the highest (undirected) eigenvector centrality in our network. The sector is according to table 2 (see missing sectors). Values are rounded. N=87

According to table 4, trade associations (3) are the most central sector with respect to the measurement of eigenvector centrality, and the second highest scoring section with respect to the in-degree measurement. This result coincides with the finding that GAME is the most central actor in the network and the results of the sector connection shown in Table 2. Again, we notice that for most actors in the digital games industry lobbying is a main issue. Vice versa for successful lobbying a central position in a network is essential. It seems that trade associations, especially GAME, succeeded in occupying this central position.

Hardware manufactures (14) are nearly as important, scoring very high in in-degree and eigenvector based centrality. The number of cases in this sector is very low and includes just the two actors Sony and Microsoft. As these two organizational units are central actors (s Table 3) this result is not surprising.

The Xing Network

In a final analysis, we will focus on the working biographies of our 41 interviewees. As described in the introduction, this analysis is driven by the idea that actors change the companies and might therefore create a network structure over time.

The data of this study does not only stem from the interviews. Most of our respondents also have public profiles on the business-network Xing, where they name their former career stations and the companies they worked for. This information is publicly available, and gives direct access to connections between the actors. In other words: The network history of the digital games industry is – at least partially – documented in these profiles.

12 of our respondents did not have Xing profiles and were excluded from this specific analysis (not as persons, but as starting points of the analysis). Information collected included the current companies of the respondents and the companies they worked for in the past. Accordingly, relations between nodes could come from actual and past working relations. Using network analysis, we reconstructed the network of these 'employment' relations. All in all, the network of past and present connections consists of 134 vertices and 115 edges between them.
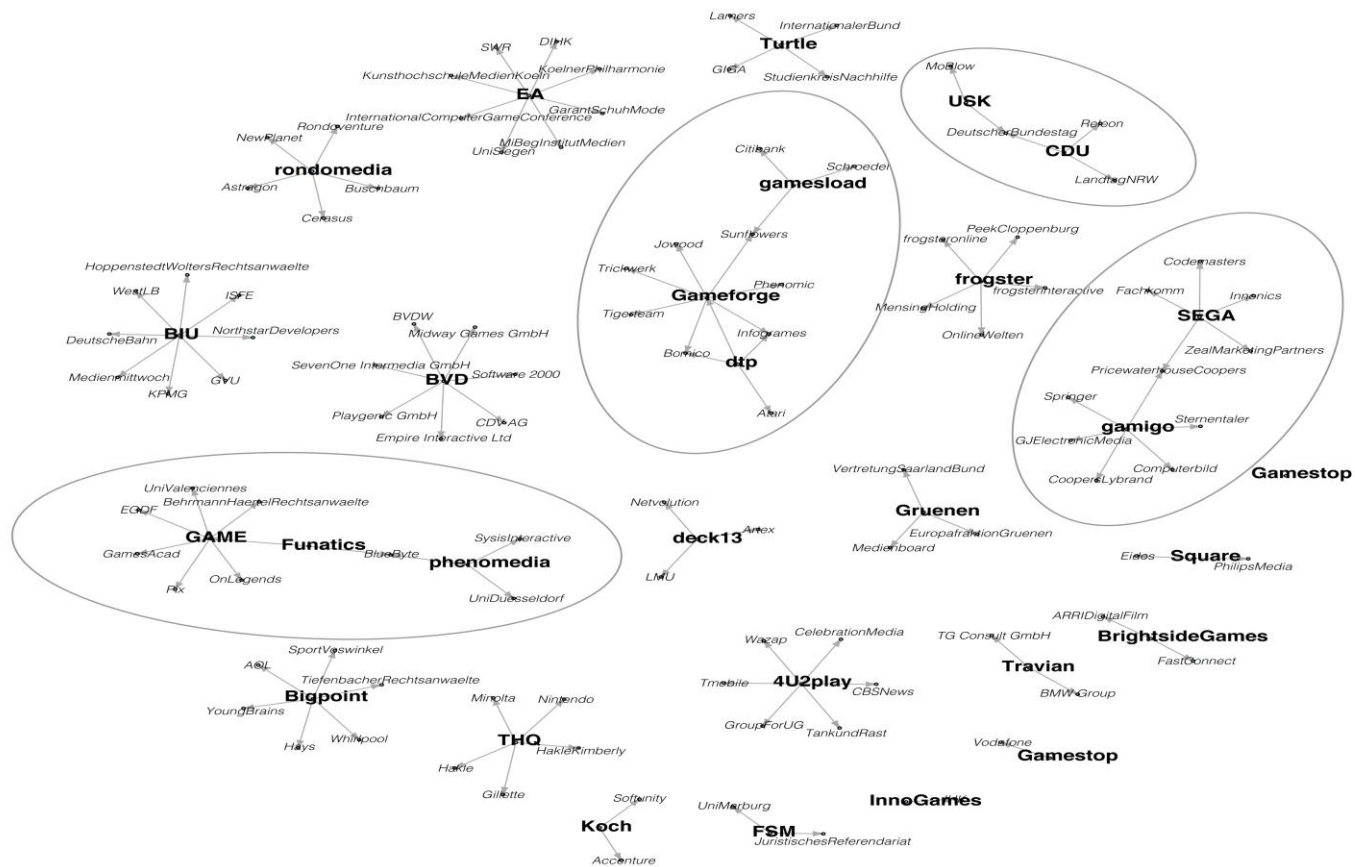
Graph 4: Network of the 26 actors with a Xing profile and their connections through past and present employment in a company. The egos are highlighted in bold.

The analysis reveals that there is no network encompassing all the people/companies we interviewed. We can see personal networks of the respondents (ego), but nearly no structure between them. Exceptions are actors working for GAME/funatics/phenomedia, SEGA/gamigo, USK/CDU and dtp/Gameforge/gamesload. They are building four connected groups. So overall, the German digital games industry does not consist of an enduring, densely knit network of interlocks.

This could have different reasons. First, not all of our respondents have Xing profiles. We therefore know nothing about the possible interconnections of the missing persons, and the starting number might have been too low. Second, actors from the digital games industry do not have regular carrier paths as in common industries with a more formalized access to jobs. The digital games industry is a quite young, and formal education like game design, e.g. at a university (which could be unifying factor in a network of past organizational relations!), is rare and exists only for some years now. Nowadays, important actors in the digital games industry are more or less career changers, coming from multiple other sectors. For example, when looking at one of the small connected groups (gamigo/SEGA), it is evident that they are connected through the company PricewaterhouseCoopers. This means that the interviewees now working for SEGA and gamigo worked at a certain point in their career for PricewaterhouseCoopers; in this case, general management skills seemed to be important to obtain the leading position in the game company (and not so much long-term experiences in the industry).

These results of this network analysis may be additionally illustrated by career statements of two selected stakeholders[8] from our guided interviews. These statements are typical for the gaming industry. In reply to the question "How did you join the interactive entertainment industry?" General manager, phenomedia publishing GmbH said *"[…] (I have a) typical career for this industry, namely untypical because I'm a certified biologist. I worked for Blue Byte, a prestigious and big publisher in Germany in those days, to make more money during my college days, so I slid into the business field software and games […]"*. Another example is the statement from the head of gamesload, the gaming portal of the Deutsche Telekom AG. Her professional path includes the companies that are not in the core-segments of the gaming industry. *"The first station after my study was Citibank[9] and then I moved to Schroedel, a scholar-book publisher. After this I started to work for a games publisher."*

Summarizing, the statements exemplify that the structures of the digital games industry are still evolving and that they are expected to keep changing. There is no evident, strong network of organization interlocks – something that might be developing with people making a career in the digital games industry and staying there for more than a few years.

SUMMARY AND OUTLOOK

In this study, we interviewed stakeholders of the German digital games industry to figure out how they are interconnected, and, in essence, how the network of the digital games industry looks like. According to the literature, we defined eight core segments and chose 41 actors/organizational units for the interviews. Relational information from the interview material was subsequently analyzed using network analysis procedures. The analysis was following the three central research questions.

In a first step, we focused on the cooperation network in order to describe the basic structure of the industry. In a first network analysis, we identified 176 new actors (organizational units), so all in all, the basic structure of the industry included 217 organizational units. Based on these results, we identified the most important actors in the German digital games industry in a second step. The term "most relevant actors" refers to the connectivity of these units. Therefore, we reduced the network to 87 actors that form the inner circle of most connected nodes.

Following this, we focused on the interconnections of this group of most connected units. The results of the study line out, that trade associations and societal institutions refer to their own sector frequently, while other actors are not that much self-related. The findings also reveal that developers are the most frequent contact partners followed by trade associations. Distributors and developers are working close together as well as browsergame companies and online gaming portals. Moreover, the calculation of centrality measurements provides us with information about the most important units and sectors in the German digital games industry.

The second part of the digital analysis indicates that there is no network structure emerging through the working biographies of our interviewees. The findings can be a hint that the German digital games industry is quite young and that actors of this industry are mostly career-changers. We expect that the access to jobs in the digital games industry will be more formalized in the future.

Following our initial study, it is planned to interview the experts two more times during the next years. We will therefore be able to monitor the dynamics of the network structures in a longitudinal way. The findings of our first analysis can be used to identify central actors and missing interview partners in the network. A more detailed network analysis should also deal with the actual content of the relations. So a more detailed questionnaire (name generators and interpreters) could be used to differentiate various networks and attributes of the relations between organizational units (e.g. strong and weak ties). This should obtain a deeper insight in the structures of the German digital games industry. Indeed detailed network analysis is very time-consuming and therefore hard to realize especially among elites like company managers and politicians. So instead of a more detailed view of the actor interconnections it is possible to monitor a bigger network. For instance a Xing analysis including not just 41 but all 217 actors we found in the games industry (see Graph 1) would maintain a more accurate view of the structure of the digital games industry.

So our survey is just a first mapping of the field that should be investigated further by forthcoming studies. Nevertheless our first findings are encouraging. Network analysis is an appropriate approach to investigate the digital games industry. We could identify emerging structures as well as central organizational units and sectors. So we could reveal a first picture of this dynamic and upcoming industry.

ENDNOTES

[1] Interview (P29) with Turtle Entertainment in September, 6th 2010

[2] The material used for this analysis just represents a fraction of questions in the guided interviews (which were much broader in scope).

[3] As the gaming market in Germany is dominated by a small number of big players, ‚typical' does not necessarily mean ‚mediocre' oder ‚medium sized'. In order to describe the largest part of the industry and to typify the industry as such, it's important to focus on these big ‚key units', as they represent the ‚typical case'.

[4] When companies are operating in more than one segment (i.e. Electronic Arts is developer and publisher as well), we decided to include them on the basis of their primary field (according to their printed self-descriptions and publicly available business data).

[5] Name anonymity is used for individual actors, but they agreed upon the use of their respective companies for our analysis.

[6] We interviewed big publishers like dtp entertainment, frogster interactive, gamigo, Koch Media, THQ and phenomedia publishing.

[7] The out-degree based centrality is a little tricky in our case. As we didn't interview all the persons who appear in the network, but just the 41 egos, the out degree might imply different things. It is possible that actors with a high out-degree have a lot of contacts. However, they could also have a tendency to name a lot of persons. For this reason, we do not (over)interpret the out-degree centrality but quote it in table 3 for the sake of completeness.

[8] Interview (P21) with phenomedia publishing GmbH in August 20th, 2010; Interview (P16) with gamesload (powered by Deutsche Telekom) in August 20th, 2010.

[9] Authors' note: Citibank is a part of the citigroup and one of the biggest financial service providers for private clients.

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APPENDIX

Sector	N
1	18
2	13
3	11
4	10
5	13
6	8
7	0
8	1

9	0
10	0
11	2
12	1
13	0
14	2
15	3
16	5
17	0

Table 5: Most connected actors' network. Actors are divided into the respective sectors.
N=87