



European
Games Developer
Federation

Games Technology Priorities for European Research and Development

The European Game Developers Federation represents the interests of the creative and technological side of the computer and video games industry – the studios that make the games. The membership of the various national bodies includes both independent and publisher-owned studios. Games development studios include small enterprises of 10 people and under, typically making casual and mobile games, whilst console game developers for the current and next generations of consoles can be from 50 to 200 people, working in a process that takes about two years per game.

The EGDF represents some 600 studios based in Austria, Belgium, Denmark, Finland, France, Germany, Luxemburg, the Netherlands, Norway, Spain, Sweden, and the United Kingdom, which together employ over 17,000 people. The European computer and video games industry, including distributors and students in game educations, encompasses 100,000 individuals.

Games and interactive content will most likely be of increasing cultural importance in the integrated world of TV, Internet and telephone. Regardless of the eventual control over gateways and transmissions, there will be an increasing demand for interactive content production in itself. Games are an important driver for hardware and network technologies, but from an SME viewpoint, the barriers to market entry are high. The games industry has still developed very interesting business models that can serve as blueprints for the internet of the future, regarding anti-piracy, micropayments and more. The increasing importance of the linkage between business models and technology is demonstrated by the games industry.

The EGDF has been surveying its members on potential research priorities for the coming years in order to convey these to the European Commission, to the research community, and to potential strategic partners from other sectors of the European ICT industry.

The information is unfiltered, and the areas not prioritised but just alphabetically ordered, but this material should nevertheless provide an impression of important potential project scenarios. The material provided here is intended as an inspiration and a constructive contribution to establish Europe as the centre of excellence for technology development for interactive media.

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Artificial Intelligence

AI is an important subject and an attractive competitive edge European game developers can acquire, in facing global competition. AI could be emotional, but also in the context of objects as well as in response to new distribution environments especially in the context of the internet of the future.

Compilers

Also, compilers are likely to get even slower with these processors. Developers are already spending approximately half their time waiting for compiling and linking on Xbox360 and PS3. Iteration time is a key factor in game development (both for code and assets), so the faster we can iterate to test our theories, the better and higher quality the game is. How can we make this more efficient?

Some ways may be new highly-parallel scripting systems with faster iteration times, or better compiler technology, or better linking technology. Faster compilers would be nice, though it would take some serious research to beat the best commercial product. Furthermore, it is not sure how European game developers will be able to benefit other than rather indirectly. Most of the compilers are owned or controlled by Microsoft, Sony or Nintendo.

Digital cinema technologies

Technologies for developing computer games can prove useful for the development of technologies for the cinema of the future. This is likely to be true both 2D for and 3 D tools and solutions for digital cinema.

E-health applications

One important aspect regarding the prevention and therapy of excess weight is the motivation of the individual to increase physical activity. The main goal would be to develop a new prevention and intervention approach based on specialized interactive computer games. Novel computer game concepts combining self-monitoring and motivation are therefore developed. In order to increase mid-term and long-term motivation of the physical activity game, the concepts should also cover different gameplay approaches as well as single player and multiplayer approaches.

High-Performance Computing

Next-next-generation consoles and upgraded PCs (circa 2010) are going to be even more massively-parallel and have many more cores (whether CPU, GPGPU, Cell or combinations of). The industry is struggling to maximise the power of six cores on

Xbox360, and eight on PS3. Will another paradigm be required when we have 32, 64 or 128 cores?

Massively parallel algorithms can be GPGPU or stream-based algorithms, or small memory or small data-set algorithms (AI searches, etc), doing everything in real-time to remove the need, and required time for, baking assets, such as ambient occlusion, etc.

Middleware standards

Licenses for game development tools and middleware (when they exist at all) are not fully adopted in the industry. Many studios create their own new tool chains, thus reinventing the wheel. At the moment there is not yet one standard middleware set or tool chain on the market. An open standard could not be bought by one player, thus threatening the investment of all the independent developer companies using this solution, as has been the case. It would be a chance for European companies as it could to a certain degree balance the fact that very little of the hardware side is controlled by Europeans. A potentially very valuable field is standardizing APIs so that middleware can become more modular and thus less of an effort to integrate or to remove. This would then also have great impact on the tool chain.

Mobile personal computers

Mobile units, smart-phones, handhelds, and related embodiments of ICT technology are likely to be the next-generation personal computers. The importance of games for such future hardware units are most likely quite obvious to the researchers and development engineers working on them. This does not necessarily mean that they are empowered to consult and involve the technology and content creators for games – the game developers – in early-stage decisions, such as regarding hardware, operating system functionality, input and output interfaces and auxiliary hardware. This is an area of high strategic importance, and the world's leading mobile unit developers and the world's leading developers of interactive content – the European game developers – should be very strongly encouraged to join forces.

Networked distribution technologies

Game developers are more and more considering self-publishing, and thus starting to distribute their own content. As the distribution of computer games is slowly shifting from boxes to online new distribution modes emerge. This is also relevant when considering the phenomenon of media convergence. In the context of the “internet of the future” network and social network based games and game-like applications should be regarded as leading indicators of future requirements on the distribution structure that is necessary to address both the needs and the rights of the creators and the end users.

Procedural content creation

Development of automated tools for the creation of specific content elements would be a big help for game developers in Europe. Automated processes allow cost-cutting business strategies - especially in an environment where the demand for content creation rises considerably (next generation consoles' graphics capabilities allow much more detail) and the personnel costs are higher than in other parts of the world. Procedural authoring and generation of content is a key to the advent of 3D asset production of tomorrow's games. Their flexibility and adaptability to the environment seem to solve the problems of different playing platforms and the challenges game developers are facing for massive world creation. Their very small storage footprint make them ideal in the new world of digital distribution and user-generated content. Key procedural techniques include texturing, animation, sound, terrain, and cities.

Trust, privacy, integrity, security, identification, accountability, IP, copyright, etcetera

In the games and interactive content field the central issues are the individuals' right to be in control of how he or she is associated with the content he or she has created, is licensed to use, or some combination thereof. The functionality and services required here should not be confused with systems basically designed for hindering access to content, such as DRM. Given solid European traditions regarding creators' rights, freedom-of-speech, personal data integrity and the like, and insistence on fundamental requirements for new business creation, such as network neutrality, Europe is uniquely positioned to take the world leadership in supporting digital content creation.

This requires that technology development, global market competition, and rights legislation are seen as aspects of a whole and are harmonised in strategic decision- and policy-making. Furthermore, it is critical to have acute awareness of the fact that the users and creators of interactive content are the source for, the subject of, and the political constituency both most knowledgeable in and most affected by the problems and opportunities that lie here.

User-Created Content

In Europe we have a very large, but also extremely diverse, home market. The dominating global actors in interactive content publishing and distribution will not adapt and localise content for small languages and cultures. However, skilled enthusiasts present there are able to adapt, enrich and create original content for the smallest territory. Their success in this is highly dependent on the availability of simple, efficient high-level tools for content creation and adaptation that also are designed from the outset with collaborative content creation in mind. This may very well have impact on some of the tool chain and middleware interoperability issues raised above.

Conclusion

Several of the indicated areas are of interest to the online and mobile games sub-sectors that are widely recognised as having particular growth potential. It cannot be stressed enough that these sectors have direct access to the end-users, and the global platform owners and publishers are not gatekeepers here, and are not barriers for European entries. The potential of user-created content in these sub-sectors is great.

It is the job of the EGDF to protect the interests of the professional content creators. Still, we are most certainly aware that from a strategic, global competitiveness perspective, it is important not to distinguish too hard between users and creators, and between professional and enthusiastic, talented hobbyist. The fans and hobbyists of today are an, if not the, most important source for recruitment of tomorrows talent. Europe should be the best place there is to be for creators of interactive content, both by driving technology development and by supporting business model evolution.

The impact of research and development in some of the fields above can of course touch on several sub-sectors of the game industry, and progress in one research and development area may reinforce others. An awareness of such possible positive feedback loops, and actions to exploit them, may be just the top-level research and development strategy that the European games industry needs to compensate for the disproportionate non-European dominance over the games industry.

Malmö, August 2009

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