Platform alternatives or platform power: Custom and commercial game engines in the work of foreigners in Czech game production

Jan Houška
Charles University
Faculty of Social Sciences
Smetanovo nábřeží 995, 110 00, Prague
jan.houska@fsv.cuni.cz

ABSTRACT

The paper addresses the evaluation of game engines by internationals, i.e. expatriates and remote workers, in 10 Czech studios that use custom and commercial game engines. The research employs longitudinal semi-structured interviews with internationals, to advance their (locally unexplored) perspectives on such tools. Some Czech studios use custom engines that internationals see as lagging behind commercial tools. However, projects using commercial engines suffer from understaffing as being skilled in them is demanded internationally. Through live service arrangements, projects with custom engines promote communal aspects of game-making in cooperation with players and modders. As this community might be unattractive to seniors with nomadic views on game development, the paper argues for their longer studio onboarding. The results demonstrate that seeing commercial engines as democratising game production is problematic in development contexts that use alternative engines to those promoted by powerful industrial centres or actors.

Keywords

game engines, Czech game production, Czechia, expatriates, remote workers, game development

INTRODUCTION

Game engines are an important driving force of video games and of their development. As Nicoll and Keogh (2019, 9) put it, a "game engine is a software tool that enables real-time interactive digital content to be created, and a code framework that enables that content to run on different platforms". We can differentiate between custom and commercial game engines. Custom engines are proprietary technologies that are developed and supported within many bigger studios. Such engines are tailored to specific game projects and their workflows (Banks 2013) and are arguably in decline in the practice of individual game hobbyists. This is due to the proliferation of commercial game engines such as Unity or Unreal, with the latter being used also in the film or automotive industry (Chia 2022). These engines are free

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and with standardised affordances for their users, making it easier to learn them. However, they also uphold platform power over the user knowledge through their asset and plugin stores, where user creations are disseminated (Nicoll and Keogh 2019).

Commercial game engines have thus received attention as both agents of democratization and user exploitation (e.g. Chia et al. 2020; Nicoll and Keogh 2019). The use of custom and commercial game engines has been a theme of ethnographic studies within individual studios (Banks 2013; Poulsen and Wirman 2024; Whitson 2018). But what is missing are studies on the position of game engines in the practices of game developers in a wider sample of game studios and the relations of such tools to the wider ecosystem of local game industries. These are important areas to address concerning both commercial and custom engines. Although commercial engines such as Unity aim to standardise game development globally, previous research has found that the use of commercial tools is contextualised and depends on local team structures and dynamics (Poulsen and Wirman 2024; Whitson 2018). Custom engines then clearly point to the specific provenance of local game industries and contextually specific ways of making games that can be fostered and supported by the local game developers (Nicoll and Keogh 2019).

Within Czech game development, many bigger companies still use custom engines while some adopted commercial ones. Nevertheless, studios often adopted them over time since they predominantly developed their flagship titles using custom engines. Established custom engines were in many cases developed by local Czech employees. It is then beneficial to look at custom and commercial engines through advancing the perspectives of internationals (i.e. expatriates and remote workers), as this paper does. Internationals are hired into Czech game studios with their views on game-making technologies that can influence but also confront the custom tools. Although local long-term workers can have similar conflicting views of custom engines, they are likely to have more favourable views of them, at the expense of commercial tools. This is due to longer exposure to such in-house engines which can induce unconscious biases such as “not invented here”, meaning “aversion to using products, standards or knowledge developed outside of group” (Sieglová et al. 2024, 83). Internationals can disrupt or support those biases but inevitably bring expertise from other national game industries where game development and its tools are different. Also, as custom engines go against *the imagined globality* of commercial and widely accessible tools (Park 2024), they form a difference in game-making to which international workers might have to adjust their work practices. Custom game engines have been previously proven to be a risk for game expats’ career plans, while commercial game engines have been said to positively influence their short-term motivations to migrate (Park 2024). Widely accessible tools such as Unity were also described as facilitating factors of remote work in game development (Majewski 2024).

But this does not mean that commercial game engines are *widely celebrated* features of globalized game development, either. Apart from the abovementioned issues of user exploitation, developers can express disdain for commercial tools as leading to the standardized look of many games (Nicoll and Keogh 2019). Like any other game developers, internationals prefer to contribute to games that they like or to games that through their proprietary engines point to specific game development traditions that they might like. This was the case of my interviewees within Czech game companies – they were drawn into them either because they were fans of game titles

developed in Czechia or because they held favourable views of active modding communities around those titles, with the existence of such communities largely enabled by proprietary engines (Lowood 2014).

This paper furthers our understanding of the use and evaluation of game engines by internationals, i.e. expatriates and remote workers, in 10 Czech-based game studios. Four of those studios use only custom engines, three use both custom and commercial game engines depending on the project being developed, and three use only commercial game engines.

Before delving into my data however, I will briefly describe the Czech game industry context and its history, while explaining the predominance of custom engines in this environment and the historical reasons behind it. The previous work on both proprietary and non-proprietary engines will be introduced in the following chapters, followed by methodology, results, and conclusion chapters.

A BRIEF HISTORY OF CZECH GAME PRODUCTION AND GAME ENGINES

The fact that custom engines are a common feature of the Czech game industry is largely due to historical developments in the 1980s Communist Czechoslovakia. As in other contexts (Jørgensen et al. 2017), this hobbyist period laid out the important foundations of game development in commercial studios. In Czechoslovakia, many of the then hobbyists and programmers enjoyed hardware tinkering and software experimentation rather than using microcomputers for pure gaming. Software experimentation was driven both by the lack of access to foreign titles in Czechoslovakia but also by the motivation to earn social capital among other amateur game makers. Many of the local text-based adventures of that time featured their custom game systems which handled e.g. basic object manipulation (Švelch 2018; Švelch and Kouba 2020). The use of custom tools at the time is unsurprising – although the first video-making tools were created in the 1980s, game engines that separate code and art assets did not emerge before 1993 (Lowood 2014).

As exploring and creating new software with custom and creative workarounds due to a lack of access to the newest hardware or lack of finances was highly celebrated among Czechoslovak hobbyists, we can argue that this period already laid out the appreciation of custom engines in later historical periods of the Czech game industry. Use of custom tools can also be related to the discourse of *golden Czech hands* that spans those different periods and celebrates Czech skilfulness and self-reliance when met with a lack of material resources (Holý 1996).

In the 1990s, the use of custom engines continued as the first commercial studios were creating similar text-based adventures with local themes. Nevertheless, even later games like *Mafia* (Illusion Softworks 2002), which did not bear overt representational traces of Czechness, included their in-house engine as leasing other proprietary engines was quite expensive and impractical due to poor documentation. Since the late 2000s, Czech game companies have been bought by international publishers and this production ecosystem saw the introduction of third-party custom game engines and later commercial engines such as Unity or Unreal. The Unity engine also became a regular production platform for indie game makers as in other countries (Nicoll and Keogh 2019). Since the 2010s, Czech game production has started attracting international workers. As of 2024, the Czech game industry hosted

34.4% of foreigners as part of its workforce and with individuals from both EU and non-EU contexts (GDACZ 2024). But despite the initial probes into evaluations of game engines by internationals (Park 2024), we are missing a more focused study in this area. The game engine use in current Czech game production has also not been addressed by earlier research. Locally, the view of internationals is important not only to capture the diversity of viewpoints on Czech game production but also to cover the inclusion of internationals into game development processes through the organizing frameworks of game engines (cf. Whitson 2018).

The ongoing legacy of custom game engines in Czech live service studios

Currently, several bigger Czech game studios – which have the most internationalized workforce – still use their custom engines. The local founders usually justify the use of custom engines in using their own code base, in creating games with simulation and open-world settings and extensive modding support which are the features that would be harder to make using commercial tools, and to retain their independence through using their own systems (also as self-publishers). The final reason of *self-sufficiency* can be related to the discourse of golden Czech hands (Holý 1996) – a local feature that is thus still traceable to the current state of Czech game development.

Concurrently with having custom engines, many Czech game companies included in my sample are using a live service production framework. It means that they regard their games as services (GaaS) and continuously update them with new content, usually in the form of additional downloadable content (Dubois and Weststar 2022). This combination is commercially beneficial for companies – they can rely on stable software and optimize it over time in their long-term updates. Constant updates are also tailored to players or modders as co-creators and as important actors who are often in close relationships with developer teams (Banks 2013; Dubois and Weststar 2022).

However, entering the GaaS model is a learning process not only for developers, formerly shipping premium titles (Dubois and Weststar 2022) but also for students and junior game developers. Students typically have to learn company tools or acquire the coding skills necessary through modding tools, supported by developers in said companies (Nicoll and Keogh 2019). Since many of the GaaS projects are built on legacy systems, and around seniority, a focus on less experienced workers is needed. Foreign game developers are similarly experiencing exclusion and marginalization (Legault and Weststar 2024; Park 2024) but their work under the live service regime has not been extensively addressed.

NON-PROPRIETARY GAME ENGINES

Game engines such as Unity or Unreal are seen as “democratizing” game production and making it accessible by circumventing the involvement of programmers. But they have also been discussed as platform tools (Foxman 2019) that enable and constrain how game developers build their content. Nicoll and Keogh (2019) termed this as being the engine’s *grain* – a set of design methodologies that orient labour of developers towards expected and even conservative outcomes. Unity, for example, is also a platform in the political-economic sense – it has a business model that aims to expand its user base “alongside the rhetoric of neutrality […] while seeking to establish its own monopoly among game development tools” (Chia et al 2020, 22).

Nevertheless, there are already existing non-commercial (or limited commercial) engine alternatives such as Twine or Bitsy. Keogh (2024) calls them grassroots game-making platforms whose aim is not to be neutral and monopolistic, but rather to offer creative space to make games with subversive game mechanics that are not built around graphical fidelity. Through their affordances, they allow for the expression of personal or niche themes – take for example mostly text-based affordances of Twine (Chia et al. 2020). They are major spaces for creative expressions of queer game developers or racial and ethnic minorities, and many subvert platformisation tendencies with their alternative business models (Keogh 2024). Also, while commercial engines such as Unity use the notion of diffused community to increase their top-down platform governance (Nicoll and Keogh 2019), grassroots platforms rather build communities of like-minded developers from the bottom up.

There are thus some overlaps between proprietary engines being used by some Czech game companies and grassroots platforms. Although the affordances of in-house engines of Czech game companies do not aim to subvert the conventions of the video game industry or offer alternative business models of platform cooperativism (Keogh 2024), there are important similarities in the communal aspects of how both engine classes function. While not facilitating the creation of experimental games, proprietary engines that shape products of many Czech game companies still form communities that might be seen as alternative to how the video game industry is framed by dominant industrial centres or actors.

PROPRIETARY GAME ENGINES

Proprietary game engines usually exhibit a lower degree of interoperability than commercial game engines and are dependent on specific software programs, workflows, or programming languages – a mix that guarantees the development of specific end-game products (Nicoll and Keogh 2019).

However, those who hold important power to add functionalities (i.e., features) to game projects with custom engines are usually programmers, forming production bottlenecks around their benevolence when adding new content (Nicoll and Keogh 2019). In-house engines also delegate more power to long-term employees and seniors – they have longer work experiences and exposure to custom tools either within specific studios or in game production generally. Programmers and senior or lead employees are often gatekeepers through which content is approved or improved and can hold more power as opposed to artists and designers in projects with proprietary engines (Nicoll and Keogh 2019).

Game developers prefer to keep track of constant technology changes and so can be unsatisfied with custom engines or outdated tools – artists can for example criticize visual quality lagging behind due to poor engine performance. Outdated tools were also among the reasons why some GaaS projects have been discontinued (Dubois and Chalk 2024). However, satisfaction with custom tools differs between game production roles – programmers and in particular engine programmers can be content with improving engine performance over time (Banks 2013). The notions of passionate and extensive programmers' involvement also relate well to the programmer-centric, tinkering-oriented roots of early Czech game development.

GaaS products do not typically aim for high visual quality but rather prefer stable code through custom engine frameworks. GaaS demands receptivity toward the player

base but also long-term planning. This leads to a paradoxical situation – developers are required to be highly flexible due to listening to players' needs while their autonomy is circumscribed to follow the update planning which is sometimes driven by the same players' needs. Developers can be similarly limited in their creativity when trying to introduce resource-intensive features – this might often mean "crashing the game" (Weststar and Dubois 2023).

METHODOLOGY

This paper comes out of a larger research project on foreign workers in the Czech game industry, for which I conducted longitudinal interviews between February 2022 and May 2024. The study draws from 3 repeated semi-structured interviews with all respondents over 6 to 8 months, with usually 3 to 4 months between the interview rounds. By using a semi-structured interview guide, some questions were standardised across respondents. For example, I asked all my respondents how game engines structure their work and if they have personal projects to account for some engine limitations. I used thematic data analysis to categorise my data and contacted and recruited my participants solely through LinkedIn.

The sample consists of 28 foreign game developers. 14 individuals are from the Central-Eastern European region, 12 are Western Europeans, 1 respondent from North America, and 1 respondent from South America. Half of the respondents (14) are in art-related roles, and the rest hold designer, programmer, marketing, and manager roles. 20 respondents are expatriates, and 8 are remote workers (living outside of Czechia). At the time of the interviews, 13 respondents were juniors, forming the most dominant workers' experience group. With regards to companies, 4 are locally owned, while 6 are foreign-owned or are branches of multinational companies. Most companies are represented by multiple respondents, except for two where I interviewed only one employee due to the smaller size of both studios.

Conducting a longitudinal study helped me to capture respondents' learning processes related to both custom and commercial game engines. Although respondents are more likely to encounter free commercial game engines during their education years, both Unity and Unreal are constantly updated with new versions which demand non-trivial adjustments from respondents. The longitudinal perspective is also beneficial when dealing with a live service production that employs a long-term strategy of in-game updates.

Interviewing respondents in different roles was essential as game engines are boundary objects, with different fields attaching different meanings and values to them (Banks 2013). Game engines are plastic to adapt different team members on one hand, but also structured enough to coordinate their work on the other (Whitson 2018). By having more respondents from the same studios, the study could look into both their individual needs and struggles regarding game engines but also overarching issues that various departments faced while working with them. In the interviews, I followed Nicoll and Keogh's (2019) delimitation of *engine workflows* and often asked my respondents which software tools they used as those tools form the individual pipelines that are different between the studios and game products.

Moreover, I asked whether my respondents had personal projects. As shown by Young (2023), game workers develop their own projects to increase their *workplace* or *creative autonomy*. To gain workplace autonomy, they improve skills needed for their

work role – e.g., character artists are using different 3D modelling programs than at their workplace to improve their skills. This type of professional development is often encouraged by studio management and can act as a promotion requirement. To gain creative autonomy, developers create personal projects to experience different circuits of game production – e.g., designers learn 3D modelling or programming in their free time. As Young (2023, 2) emphasised, "the desire to achieve creative autonomy is enabled by the proliferation of tools and platforms to make games", including commercial game engines. However, Young (2023) mostly addresses the experiences of hobbyists employed outside of game studios and I will be focusing solely on full-time game developers – in the specific context of Czech game development where many studios use custom engines.

The study is limited by not interviewing local C-level executives or seniors and leads who helped building custom game engines or had longer exposure to them. They also established knowledge/power hierarchies when it comes to company tools (Whitson 2018). But in a few cases, I interviewed programmers in projects with custom engines, in which engineers have quite extensive power (whether they are local or international).

RESULTS

The structure of the results section follows the division of studios into two categories: first, companies that use custom game engines under the live service production and second, companies that use commercial game engines. The overall issues that workers have with these technologies will be introduced, as well as different approaches to personal projects among workers in either category.

Custom game engines and live service group

In the custom engines group, there were overall problems with outdated tools, which induced workflows that would be seen as outdated or niche from a global standpoint. Respondents described custom engines as lagging behind due to suboptimal engine performance or as causing lower graphics quality. These issues were worsened by the lack of programmers in the wider Czech game industry (GDACZ study 2020). The following quotes demonstrate these issues and are from respondents solely from live service companies:

"We lag behind in tools, we lag behind in pipeline. The game looks very dated at this point. And I think what we are in need of is modernization. Modernization from top to bottom, new tools, an update of the engine, an update of the editor […] I think what we need more than people just keep shovelling, is that we need programmers that will revolutionise the tools we use." (Central Eastern European artist, expatriate)

"The biggest problem with our tools is performance issues. If we want to add something new, we have to make it somehow similar to things that we already have. Adding something similar is not a problem. But adding something new with a new way of programming, programmers need to test it and see if it's not breaking the performance of the game." (Western European designer, expat)

"With how our engine is constructed, certain things have to be made in a certain way […] Making collisions for models, we require a version of the software that is like 8

years old because the script for making those collisions doesn't work on higher dates." (Central Eastern European artist, remote worker)

As also outlined in the quotes, there was a general development pattern of live service studios to make games optimised rather than cutting-edge in terms of graphical realism. Especially international juniors then saw custom engines as local game industry quirks that they had to adjust to. However, they also saw those adjustments negatively as something that should have been quicker due to the teamwork misalignments they had experienced (Park 2024). This might explain their underappreciation of custom engines, as those rather demand longer onboarding. Juniors had to learn how to not go beyond such technical limitations and this necessitated frequent communication with their (often local) colleagues. Furthermore, these limitations were sometimes normalised by local game workers whereas some internationals saw custom engines as inaccessible "voodoo" software (Whitson 2018) and lacked guidance when working with them.

"There's a bunch of stuff in this engine that are like unwritten rules for making the games. Don't really get to know that until you make the mistake. And until some senior manager tells you: Oh, we don't do it like that. You ask why it's so? Just don't do it." (Western European designer, expat)

However, the management of most Czech live service studios in my sample was aware of these issues by providing internships to juniors, educating them in their custom engines. The situation was also different for senior respondents across studios who were responsible for improving processes, such as the overall graphics pipeline. They highlighted that in their work in custom game engines, it was not uncommon to be inspired by commercial game engine workflows or other GaaS. Some respondents across work roles also had more favourable views on custom engines, expressing the lost aura of specialized craft due to the use of commercial engines (Nicoll and Keogh 2019). These respondents, while still critical of the dependencies of custom tools, were generally more culturally fitting to company cultures and were more likely to stay as long-term employees (Park 2024). Furthermore, some respondents were envious of those working on flagship titles with more updated versions of the same custom engines – their views thus differed between projects.

The evaluation of custom engines also differed between the production roles. Artists were mostly critical of the lesser visual quality of games due to rigid engine frameworks that made their work less competitive in the global job market. But some programmers were less critical of custom engines as they experienced a sense of vocation (Banks 2013) when e.g. trying to improve custom tools. However, due to their importance or small numbers, some were overworking themselves and framing overtime as a "product need" or as a good crunch (Cote and Harris 2023). Game artists and designers on the other hand experienced a sense of creative fatigue (Dubois and Chalk 2024) or career stagnation in GaaS. Game designers were sometimes required to program either because of smaller teams or their job responsibilities – they had to fit with their job profiles as game designers with programming backgrounds or should have been familiar with company products as frequent players or modders, but often were not. This might reduce the pool from which the companies could hire fitting workers as they would often hire from within the modding communities.

Many respondents felt that companies should change their product strategies – either improve custom game engines or develop new products and discontinue support of

old ones altogether. Due to the issues with custom engines, respondents spoke about their careers in Czech game companies as transitional periods – this was especially the case for juniors. For them, technology or product changes were among the main incentives to stay in the studios for 3 to 5 more years. These incentives were mentioned by seniors as well – but some of them eventually left the companies during my research because of team and communication issues or lower salaries instead.

To address issues with custom engines, respondents across production roles worked on personal projects in their free time. These projects often improved their creative autonomy, meaning that they learned skills and workflows of different work roles than theirs. Sometimes, they developed smaller game projects together with other developers and "wore more hats" or they learned skills for different roles. Some also improved their workplace autonomy while refining skills needed in their work role. Regardless of the type of autonomy being addressed by the project, respondents used tools and frameworks that they regarded as being more global and relevant for their future career – commercial game engines (e.g. Unity), different programming languages (e.g. C++) or software programs. They were not using non-commercial alternatives such as Twine in their personal projects. Developers who improved their creative autonomy by obtaining skills in different roles were in precarious situations resembling that of hope labour (Young 2023) – they have undergone free labour in personal projects in the hope of future employment. But as they could not test their obtained skills in their main job due to outdated workflows, there was no guarantee of such future employment prospects. Some mentioned learning "completely different things" in their free time from what their workplaces demand. Paradoxically then, the personal projects respondents developed further moved them away from locally developed games towards work with global tools.

But all in all, Czech live service companies were also regarded as stable workplaces. Although not incidental in some long-term projects and teams, crunch was described as rare or as being discouraged by team colleagues, both local and international. Working on popular projects amongst players, respondents could count on strong company performance, resulting in bonuses to their basic paychecks. As highlighted by respondents, working at stable workplaces is worth a lot during layoffs in international game studios, be it big or small.

Commercial game engines group

Companies working with commercial engines functioned under globalized tools and software programs. They used licensed engines which are either sold or free to use to third-party studios. Some respondents also mentioned that specific commercial engines attracted them to Czech game companies that used them, acting as a short-term relocation incentive (Park 2024).

Similarly to live service companies with custom engines, studios using commercial tools did not have enough programmers either. But the talent shortage was not limited to programmers. Especially studios working with Unreal were experiencing a lack of specialized workers in many roles proficient in the engine – a situation that is familiar to film production practitioners using Unreal (Swords and Willment 2024). The global use of engines like Unreal or Unity also caused developers proficient in them to be demanded by other international studios. This applied especially to seniors knowing Unreal who were harder to hire into Czech game studios. But there is a further lack of local workers skilled in commercial game engines – this is likely a result

of the proliferation of custom engines in the Czech video game ecosystem and the lack of game development education in Czechia (GDACZ study 2020), which had only been evolving in the past few years. On the other hand, foreigners from other video game fields often had educational experiences working with commercial game engines. This led to a paradoxical situation when local leads were not proficient in using commercial engines, but internationals were. As the following quotes show, this mismatch in skills can be further exacerbated when companies switch internally to commercial game engines with new projects.

“The thing that was presented to me was that they have experienced people in Unreal but the reality of it was that nobody worked in Unreal Engine. They’re all learning and that is also one of the reasons why the project is so delayed.” (Central Eastern European designer, expat)

“We made a switch to a commercial engine, but the leads did not get the time to get used to it. The switch was fine for me because I used the engine during my studies. But everything else that I learned was basically from YouTube tutorials, experience and messing around. But in our company, there's no one experienced besides me to teach me stuff in that engine.” (Western European animator, expat)

Using commercial game engines also stimulates the bandwagon effect when many studios start using them due to their rapid popularity. This can lead to hiring issues but also underappreciation of skills in custom engines that might be overlooked, especially in the Czech video game field where such technologies are common.

“I think it's a weird crisis where in the last two years there were many companies that switched to Unreal. And right now, there's a shortage of Unreal experienced people. They're all being picked up.” (Western European animator, expat)

But also, learning new technologies is an ongoing learning process for both local and international workers. Some foreign juniors or internationals with experiences from non-game related work fields did not use Unity or Unreal previously, either. Both locals and internationals also have troubles catching up with constant and often radical updates of commercial engines and their functions (Nicoll and Keogh 2019).

Knowledge of commercial engines and their updates is again diffused and *not localized* – for example, you cannot ask an engine programmer from Epic Games to add new features to Unreal Engine, whereas with custom engines you technically can if in-house programmers have enough time and skill capacities to do so. But as updates and new features of commercial game engines are part of the diffused knowledge of their user base, respondents also told me that it is easier to “Google something” when encountering unexpected hiccups compared to custom engines. Many of the respondents benefited from this diffused knowledge already during their educational years as they learned the newest tools and were working in open spaces similar to those of bigger studios – in a way, their game education experiences had already created an *industry* for them. Although internships for juniors were also common in studios with commercial engines, these mostly consisted of checking whether they had the skills studios needed. Compared to studios that educate interns in their custom tools, respondents in companies with commercial engines said that during internships “not much has changed” as they were used to these tools thanks to their university studies.

Respondents from the second category of studios still worked on their personal projects in their free time. Typically, they were developing them due to the uncreative stage in the project or portfolio reasons or to improve their workplace autonomy, i.e. to learn or further skills related to their work roles. Although some game artists learned programming in their free time, their efforts were directly related to commercial engines that studios worked with, not to different ones (as in a custom engines group). Many respondents framed their experiences in commercial game engines as *always relevant* and so using them was seen as beneficial for their future careers. Within three studios that used either commercial or custom engines for different projects, the usual demand of workers on projects with custom engines was to be delegated to projects with commercial ones, to keep track of global industry trends (Legault and Weststar 2024).

CONCLUSION

This study deepens our understanding of issues with both custom and commercial engines not only in the Czech game industry in particular, but in game development in general. While commercial engines have been extensively discussed for their platform power, the same attention was not devoted to custom engines as the infrastructures of GaaS. This text thus opens discussion about implications of aging software in GaaS regime (cf. Dubois and Chalk 2024), which can be important also for industry centres such as South Korea which includes many long-established live service studios (see also Dubois and Weststar 2022).

Czech game production is, in regard to game engines being used in the bigger studios, between the global and the local. At the same time, those studios that use custom engines are in dominant positions in the Czech game industry. Custom engines thus remain embedded in the local industry as their essential features. Local game companies successfully identified and capitalized on content niches and service those over time using their own engines. Due to their live service arrangements, we can anticipate that this is also a future state of the industry. However, this is not a future imagined by international game workers who would like to challenge this status quo bias (Sieglová et al. 2024) and help in developing new titles to not fall behind global game industry developments and keep their portfolios updated. This was the issue raised especially by game artists who mentioned the underwhelming graphical quality of live service titles.

Being up to date in the game industry, at least according to some respondents, means using commercial game engines. Nevertheless, there is an inherent paradox at play here. Using the most up-to-date global tools might work against their intended purpose – rather than simplifying game production locally, they complicate it because being skilled in them is sought-after and needed globally, causing a shortage of workers. Commercial engines thus do not democratise game production globally as they can cause understaffing and underskilling in production environments that are more used to custom tools. This also gives custom engines a competitive advantage over commercial tools within the local context. All in all, as commercial engines are accessible to broader demographics they might be troubling in the local contexts that have their own traditions of game development (Nicoll and Keogh 2019).

The context of the study is important for another reason – so far, perspectives of game workers on engines structuring their labour were captured in industry centres, for example in Finland (Park 2024) or Canada (Young 2021). But the Czech game

production stands aside from the imagined globality (Park 2024) of commercial game engines and common know-hows as a semi-peripheral context of game development. For example, it seems that while the Finnish game industry hires already fitting candidates that use commercial engines, in the Czech game industry, the workers oftentimes have to be "made fitting" through internships and longer onboarding due to custom engines. But it also means that Czech game companies are more able to educate juniors in their custom tools in a long-term perspective, leading to their possible retention. Some internationals even purposefully chose to work on certain products, which rely on specific proprietary game engines. Such engines also enable the co-creation of players (Banks 2013), and internationals can thus feel as part of a like-minded community of developers and players who are attracted to certain games, even if they are working remotely. This goes against the previous research findings on remote game development, as it was identified to be driven and enabled predominantly by commercial engines (Majewski 2024; Park 2024).

At the same time, hiring senior workers who are not enthusiastic about a particular product is made more problematic since they already have quite a nomadic outlook on game development and might prefer using commercial engines. In a way, Czech game companies might be too local for certain workers who expect techniques and technologies to be the same when in reality they differ between cultures (Nicoll and Keogh 2019). Czech live service game companies highlight their local aspects at the expense of global ones, somewhat in direct opposition to other contexts of game development such as Ireland or Finland (cf. Kerr 2017; Park 2024). But when it comes to companies that are developing premium titles while using commercial engines, quick onboarding and being able to fit quickly in the team were highly valued, similarly to the context of Finnish game development (Park 2024). While possibly negative for long-term retention, widely available commercial technologies also ease mobility stress among workers, and companies using them were sometimes framed as more innovative within Czech game production by my international respondents.

However, we must keep in mind the neoliberal and economic drivers that often drive innovation in the gaming industry (Harvey and Fisher 2013). It is also understandable that the live service studios stick with their own, time-proven technological frameworks to not risk *too much* in an already risky game production environment, further impacted by economic instability and layoffs. As long as the profits of old products outweigh their costs (which is often the case), the studios are not going to move into uncharted waters of game production by developing new products. But another issue lies in the question of how to make niche Czech game production more transparent and attractive for international workers, especially seniors. The plausible suggestion would be to offer longer onboarding periods for seniors as well. While this might prove costly in short-term period since seniors are expected to execute their tasks relatively quickly, it could prevent potential future misunderstandings and lead to more inclusive integration of senior workers in the teams. This way, they could also gain more understanding of Czech game development, a more alternative game-making community that often purposefully stands aside the platform power of dominant commercial game engines.

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