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Jeffrey V. Nickerson  
*Stevens Institute of Technology*, jnickerson@stevens.edu

Stefan Seidel  
*University of Liechtenstein*, stefan.seidel@uni.li

Dov Te'eni  
*Tel Aviv University*, teeni@post.tau.ac.il

Lior Zalmanson  
*Tel Aviv University*, zalmanso@tau.ac.il

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# Gaming and the Metaverse: Trailblazing the Future of Information Systems and Platforms

*PDW*

## **Jeffrey V. Nickerson**

Stevens Institute of Technology,  
Castle Point on Hudson, Hoboken,  
NJ, 07030, USA  
jnickerson@stevens.edu

## **Stefan Seidel**

Institute of Information Systems  
Fürst-Franz-Josef-Strasse, 9490  
Vaduz, Liechtenstein  
[stefan.seidel@uni.li](mailto:stefan.seidel@uni.li)

## **Dov Te'eni**

Coller School of Management  
Tel Aviv University, Israel  
teeni@tau.ac.il

## **Lior Zalmanson**

Coller School of Management  
Tel Aviv University, Israel  
zalmanso@tau.ac.il

## **Abstract**

*Video games and its industry are leading practice in a variety of digital domains including autonomous design (procedural generation with AI) and real-time user/community engagement mechanisms. The gaming industry has been experimenting with various business and revenue models, pioneering many areas of data-driven design and innovation management, and blurring the lines between work and leisure. With the rising interest in building Metaverses and immersive experience design, many firms look at open-world videogames as the default model. Despite their cultural and digital importance, game environments are rarely the subject of IS research. They still carry stigmas of not being serious business or generalized enough for scholarly consideration. The PDW aims to formulate the effect of games, their artifacts, environments, and business models on the larger IS scholarship and draw a way forward for greater engagement of IS scholarship within the video game industry.*

**Keywords:** Video Games, Gamification, Metaverse, Virtual Worlds, Innovation

## **Introduction**

In the last decade, and especially with the outburst of COVID-19, video games have been proven to be a cultural phenomenon that has had a great influence on society at large. Its industry is currently larger than the music and film industries combined and is considered more digitally innovative.<sup>1</sup> Despite the growing popularity of video games and their effects on various managerial, societal, and behavioral aspects, it is surprising that this industry and its practices are still underrepresented at information systems (IS) journals and conferences, including ICIS. It is however our contention that studying video games offers great potential to understand the future of information systems and digital platforms. The proposed PDW aims to address this opportunity and explore how studying video games and their context can inform discourses that are relevant to broader organizational, managerial, and especially information systems communities.

## **Topic Areas**

The PDW will address how studying gaming and the video game industry can inform our understanding of key IS topics and discuss how to involve the gaming industry in IS research. Amongst the IS topics covered by the PDW are the use of autonomous tools development in design operations and innovation management; the emergent Metaverse, communities, and platforms as game environments; the analysis of real-time user engagement; and AI-human interaction.

From an innovation and operations management perspective, video games have become the testbed for the use of autonomous tools that generate large amounts of varied digital content (Hendrikx et al., 2013; Seidel et al., 2019; Seidel et al., 2018), as well as novel development and design approaches that involve human designers and these autonomous tools, including, procedural content generation (Hendrikx et al., 2013; Yannakakis and Togelius, 2015; Seidel et al 2019b), procedural modeling (Müller et al., 2006; Watson et al., 2008) and computational creativity (Colton and Wiggins, 2012; Liapis et al., 2014). In this context, we will discuss what managerial issues emerge when deploying these tools in creative processes.

From the perspective of the future online platforms and online communities, the video game product (the base game) has been transformed from a goal-in-itself or a standalone product to a dynamic platform (Hagi 2017). These platforms, now often crafted as open-world environments co-created with users, are hybrids of social networking and game environments. Recently, they have served as inspiration for the new generation of virtual worlds, or Metaverses, a key development that has led to the re-labeling of Facebook into Meta. Virtual worlds are not new, and MIS Quarterly dedicated a special issue to them in 2011 (Wasko et al. 2011). In this context, we will discuss how this new generation of virtual worlds differs from earlier concepts and what should be the design considerations beyond the Metaverse approach.

From the perspective of user engagement analysis, gaming environments are unique as they include multiple synchronous and real-time user interactions happening both with the product and with fellow gamers. With the introduction of streaming platforms (e.g., Twitch, YouTube Gaming), more avenues of user engagement dynamics with games have emerged. On these platforms, gamers perform and broadcast their gaming experience (i.e., “gameplay”) in real-time (Poretzki et al., 2019). These sessions typically include synchronous interactions with viewers through live chats and comment sections. Streamers engage in word-of-mouth (WoM) and communal discussion with their viewers, sharing their personal views of the game’s positive aspects and limitations. These interactions provide an additional layer to better understand, predict, and shape user engagement, which naturally feeds into the broader business context (e.g., in terms of purchase behaviors related to games or in-game downloadable content [DLC], subscriptions to support free-to-play games or streamers, etc.; Wulf et. al 2020). Moreover, the ease of access to large volumes of real-time and pre-recorded data (e.g., videos on demand, or VODs) via application programming interfaces (APIs) provide a unique opportunity to develop, test, and implement dynamic systems that leverage this multi-modal information for generating predictions or funneling users toward desirable outcomes while taking into consideration measurable, heterogeneous user characteristics. In this context, we will discuss the relevance of video gaming and the game industry for the study of complex user engagement dynamics and their connection to issues of monetization and business model design.

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<sup>1</sup> <https://www.nasdaq.com/articles/this-opportunity-for-investors-is-bigger-than-movies-and-music-combined-2021-10-03>

Last, from the perspective of AI-human interaction, we note that many AI researchers have used a game metaphor when stating that future AI-human interactions should not be designed as competitive games but rather cooperative ones (Dafoe 2021). Indeed, many of the early popular studies of machine learning and AI-human interaction were in the context of zero-sum games such as Chess and Go, where AI beat the human intelligence.<sup>2</sup> However, going into the future, society might benefit from designing AI-human relationships that resemble collaboration in online cooperative games where multiple parties, both human and non-human, are collaborating to achieve a similar goal. Games may also be used as inspiration for how to make these collaborations engaging and fun. In this context, we will discuss design considerations for AI-human interactions and the role of games in paving the future for meaningful and beneficial relationships with AI aids.

## Take Away

The organizers of the PDW believe this session can help to articulate research opportunities related to video game-related practices and business models, increase engagement with video games as an empirical phenomenon of interest to the IS community, encourage scholarly collaboration, and draft the path forward to address organizational and IS questions through the study of video games environments.

## Session Timing

The workshop is planned for ninety minutes. The first part will introduce the subject and its potential relevance for IS research. Next, we will briefly describe the four possible sub-fields common to the game industry and relevant to broader IS scholarship: Autonomous tools and procedural generation, Metaverse design, Real-time and multi-modal user engagement analysis, and AI-human interaction. Each field will be discussed in a round table, highlighting possible research opportunities, questions, challenges, and paths forward. We will then regroup and share the key insights from each roundtable and hold a Q&A session with the audience for more remarks and clarifications. We will conclude with a discussion highlighting the unique challenges and ethical concerns (including a focus on younger audiences) in researching gaming environments and suggest some paths forward in conducting research with the video game industry.

Time	Content
00:00-00:05 (05')	The relevance of video games, the gaming industry and the Metaverse to IS research <i>Lior Zalmanson</i>
00:05-00:17 (12')	Presenting the four topics (each in three minutes): Autonomous tools and procedural generation – <i>Stefan Seidel</i> Design for the Metaverse environments – <i>Jefferey V. Nickerson</i> Real-time and multi-model use engagement analysis – <i>Lior Zalmanson</i> AI-human interaction - <i>Dov Te'eni</i>
00:17-00:52 (35')	Dividing attendees into roundtables and discussing each of the four topics
00:47-01:15 (28')	Summarizing key insights from each of the round tables, connecting the four together and to broader IS themes, and conducting Q&A session with the larger audience
01:15-01:30 (15')	Discussing unique challenges, ethical concerns and the paths forward for IS research and education related to games and the game industry Moderated by <i>Lior Zalmanson</i>

<sup>2</sup> <https://www.newyorker.com/science/elements/how-the-artificial-intelligence-program-alphazero-mastered-its-games>

## Audience Requirements

Prior knowledge of information systems will help the audiences follow the PDW talks and participate with the organizers and presenters. Shared knowledge of games and the gaming industry will also help their engagement, but they are not required.

**Onsite Audience Requirements:** Audiences do not need to bring any devices and materials to the workshop. They can listen to the presenters and discuss the presenters' materials.

**Virtual Audience Requirements:** Watching the workshop online needs an online device only. But the virtual members cannot participate in discussion for the sake of keeping the fluent conversation onsite.

## Maximum Number of Participants

**Onsite Participants:** The optimum number of participants is between forty and fifty for active discussion, but the organizers can also manage around one hundred participants according to their experience.

**Virtual Participants:** No limitation on the number of virtual participants.

## Organizers' and Presenters' Bio

**Jeffrey V. Nickerson** is the Shulman Chair for Business Leadership and Professor of Digital Innovation at Stevens Institute of Technology. His research focuses on how work and skills are evolving as autonomous technologies become more prevalent. He is currently an investigator in a National Science Foundation-funded project in the Future of Work program.

**Stefan Seidel** is Professor and Chair of Information Systems and Innovation at the Institute of Information Systems at the University of Liechtenstein and an Honorary Professor of Business Information Systems at the National University of Ireland, Galway. His research focuses on digital innovation, digital transformation, and artificial intelligence in organizations and society.

**Dov Te'eni** is a Professor Emeritus at Coller School of Management, Tel Aviv University. He currently studies how to design human and autonomous agents that can learn from each other reciprocally, and how feedback at different levels of abstraction can leverage AI to improve Human-Computer interaction. Dov was awarded the AIS Fellowship (2008) and LEO Lifetime Exceptional Achievement award (2015).

**Lior Zalmanson** is an assistant professor at Coller School of Management, Tel Aviv University. His research interests include social media, user engagement, internet business models, human-AI interaction, and algorithmic management. In his parallel life, he creates VR experiences for play and study. his most recent VR work (about the bystander syndrome) debuted at the 2021 Tribeca Film Festival.

## Commitment Statement

All the organizers and presenters acknowledge they know what the Professional Development Workshop needs and declare that they will be committed to delivering presentations and discussions in the given ICIS time slot.

## References

- Colton, S., and Wiggins, G.A. 2012. "Computational creativity: The Final Frontier?," In *Ecai*, vol. 12, pp. 21-26.
- Dafoe A., Bachrach Y., Hadfield G., Horvitz E., Larson K. and Graepel T. 2021. "Cooperative AI: Machines Must Learn to Find Common Ground," *Nature* (593:7857), pp. 33-36

- Hagiu, A. 2007. "Merchant or Two-Sided Platform?," *Review of Network Economics*, (6:2).
- Hendrikx, M., Meijer, S., Van Der Velden, J., and Iosup, A. 2013. "Procedural Content Generation for Games: A Survey," *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)* (9:1), pp. 1-22.
- Liapis, A., Yannakakis, G. N., and Togelius, J. 2014. "Computational Game Creativity," *ICCC*.
- Müller, P., Peter Wonka, Simon Haegler, Andreas Ulmer, and Luc Van Gool. 2006. "Procedural modeling of buildings." In *ACM SIGGRAPH 2006 Papers*, pp. 614-623. 2006.
- Poretski, L., Zalmanson, L., and Arazy, O. 2019. "The Effects of Co-Creation and Word-of-Mouth on Content Consumption—Findings from the Video Game Industry," *International Conference on Information Systems (ICIS)*, December, 2019.
- Seidel, S., Berente, N., and Gibbs, J. 2019. "Designing with Autonomous Tools: Video Games, Procedural Generation, and Creativity," *International Conference on Information Systems (ICIS)*, Munich, Germany, December 15-18, 2019.
- Seidel, S., Berente, N., Lindberg, A., Lyytinen, K., and Nickerson, J. 2019. "Autonomous Tools & Design Work: A Triple-Loop Approach to Human-Machine Learning," *Communications of the ACM* (62:1).
- Seidel, S., Berente, N., Martinez, B., Lindberg, A., Lyytinen, K., and Nickerson, J. 2018. "Succeeding with Autonomous Tools in Systems Design: Reflective Practice & Ubisoft's Ghost Recon Wildlands Project," *IEEE Computer* (51:10).
- Watson, B., Müller, P., Veryovka, O., Fuller, A., Wonka, P., and Sexton, C. 2008. "Procedural Urban Modeling in Practice," *IEEE Computer Graphics and Applications* (28:3), pp. 18-26.
- Wasko, M., Teigland, R., Leidner, D., and Jarvenpaa, S. 2011. "Stepping into the Internet: New Ventures in Virtual Worlds," *MIS Quarterly* (35:3), pp. 645-652.
- Wulf, T., Schneider, F. M., and Beckert, S. 2020. "Watching Players: An Exploration of Media Enjoyment on Twitch," *Games and Culture* (15:3), pp. 328-346.
- Yannakakis, G. N., and Togelius, J. 2011. "Experience-Driven Procedural Content Generation," *IEEE Transactions on Affective Computing*, (2:3), pp. 147-161.