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Частина 3

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12. Revolutionizing Building Performance Simulation: A Retrospective Analysis of Dru Crawley's Four Decades of Influence

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Introduction. The 40-year milestone of Building Services Engineering Research & Technology (BSER&T) coincides with a revolutionary period in building performance simulation, catalyzed by advancements in microprocessor technology and the collaborative efforts of professionals bridging building services engineering and software development [1]. Dru Crawley's career not only bears witness to this evolution but also serves as a driving force in the development and maturation of the open-access simulation environment pivotal to numerous research projects published in BSER&T. As we celebrate this anniversary, Crawley reflects on his journey, encapsulating the essence of this transformative era.

Materials and methods. Crawley's journey into building performance simulation commenced during his undergraduate years in architecture, where he was introduced to NECAP (NASA's Energy Computer Analysis Program), a precursor to modern simulation tools (1). Delving into the arcane intricacies of mainframe computing and Fortran programming, Crawley navigated the complexities of early simulation methodologies, from punch cards to interactive interfaces. Subsequently, his career path led him through various research groups and consultancies, where he honed his expertise in energy efficiency and renewable energy through the application of building energy simulation tools like DOE-2.

Results. The evolution of simulation technology unfolded alongside Crawley's career, from the cumbersome mainframe-computing era to the advent of personal computers. His involvement in large-scale building projects provided invaluable insights into design's iterative nature and energy simulation's evolving complexities. As desktop computing power surged, Crawley's contributions extended to national laboratories and governmental agencies, where he played a pivotal role in advancing tools like EnergyPlus and supporting initiatives such as Energy Star Buildings. His journey culminated in the fusion of DOE-2 and BLAST, paving the way for EnergyPlus and ushering in a new era of simulation-driven design and policy development.

Conclusions. Crawley's reflections encapsulate the transformative impact of simulation technology on the built environment and the imperative for continued innovation and collaboration. As the field progresses, challenges persist, particularly in the integration of simulation with Building Information Modeling (BIM) and the realization of cloud-based computing. However, Crawley's vision for the future is optimistic, foreseeing a landscape where simulation tools empower designers to create low-impact, carbon-neutral buildings with unprecedented efficiency and precision. In essence, Crawley's journey serves as a beacon for the next generation of building performance simulation practitioners, inspiring them to push the boundaries of possibility and shape a sustainable future.

References

Crawley, D. (2019). Musings on more than 40 years in building performance simulation. *Building Services Engineering Research & Technology*, 40(5), 557–559. DOI: 10.1177/0143624419859702.