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Module3-1
Galaxy Game and PDP-11, with references to Computer Space

Galaxy Game on the PDP-11 was historically significant for gaming especially in that it helped bring video games to consumers. Prior to Bill Pitts and Hugh Tucks creation video games were limited to commercial scale facilities like universities, and the 'hacker' communities within, largely due to price and complex interaction. Earlier games, especially computer games, generally required a significant amount of knowledge and skill to setup in the first place, not to mention access to both a game and the proper machine to play it on. Although Pitts and Tucks' motivations were largely still academic and technical, their resulting achievement was meant to test the consumer motivation for video games as a whole. They were so entranced with games in Stanford's computer lab, they thought people would be willing to pay money for it. Today, we know that's certainly true, but Galaxy Game was in many ways the precursor to the ever popular arcade games, without which video games likely wouldn't be what they are today.

Sourcing parts from previously unrelated industries, coin receptacles built for jukeboxes, and joysticks from the B-52 bomber, much of the, albeit limited, success of Galaxy Game was thanks to their user interaction focused unit. Players didn't need to know how computers work, or how to set one up to play; you just walked up, stuck a coin in, and started playing. They weren't the first to do such a thing, but to do it in a way that was easily accessible was paramount to proving that the general public was interested in video games. Their system even had an extra monitor purely for an audience to better view what was happening, increasing and emphasizing the social atmosphere arcade-like systems were able to produce.

Unfortunately, Galaxy Game wasn't even close to commercially viable due to the excessive cost of the PDP-11, though this wasn't part of their goals anyway. Comparisons can be made between Galaxy Game and Computer Space, in part due to their similar timing, in that Galaxy Game was built as a proof of concept that reached beyond just the technical capabilities of computers, while Computer Space was a more business oriented endeavor. This can be seen in the cheaper hardware platform of Computer Space, even though it ultimately wasn't powerful enough for the original software design. The PDP-11 was certainly strong enough for Galaxy Game, but was much more costly to the point of losing any commercial viability. Nonetheless, both projects revealed that there was not only an interest in video games outside of scientific communities, but also that people were willing to pay for it.

The PDP-11 itself was interesting choice of platform for Galaxy Game, because of the previously mentioned cost. It was a minicomputer, but it certainly wasn't designed for one person to own. It did however provide some innovative features, particularly regarding IO, that better facilitated human interaction with the system. The orthogonal instruction set provided a unique ability to move data from IO to IO, skipping internal memory entirely. This had particular use in graphical interfacing, though I don't know if this played a part in Galaxy Game. This feature also simplified code by most standards, decreasing the time cost of programming. Memory mapped IO was also a consequence of this, that simplified, though limited, the interactions between external IO and the PDP-11 system itself, with the potential to speed this interaction up. Priority level interrupts were also quite rare in hardware at the time, allowing for more complex IO. Finally, unlike most previous systems, the PDP-11 was designed specifically for mass production, which had the potential of increasing the commercial viability of any video games produced for it. Without detailed understanding of the Galaxy Game system I can't say how much these innovations benefited the gaming industry directly, but they did bring about similar features in future systems, and help bring the cost of those systems down over time, which was paramount to bringing video games mainstream.

Not relevant to games, but the PDP-11 is still employed today as an educational tool. I currently tutor a class at WSU that teaches students how to program the PDP-11 (which is really fun). The system is

also still in use in situations that require high reliability and security via obsolescence, including nuclear reactors! There would be a certain irony in making a video game for the PDP-11 in which the player works to keep a nuclear reactor running.
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