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Simulation of collaborative product development knowledge diffusion using a new cellular automata approach

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ABSTRACT

In order to quantitatively examine the diffusion process and pattern of collaborative product development (CPD), this paper puts forward a quantitative research model of CPD knowledge diffusion based on improved cellular automata. In light of the idea of SIS epidemic model and the local knowledge interaction characteristic of CPD knowledge diffusion, the influencing factors of knowledge diffusion are abstracted into the parametric variables in the process of knowledge diffusion, and the knowledge-SIS (K-SIS) model is constructed based on improved cellular automata for CPD knowledge diffusion. Finally, the K-SIS model is simulated to study the diffusion process and pattern of CPD knowledge, revealing the influence mechanism of CPD knowledge diffusion influencing factors on the diffusion process. The research results provide valuable reference for improving the efficiency of CPD knowledge diffusion.

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Izvirni znanstveni članek

Simulacija difuzije znanja pri skupinskem razvoju izdelka s pomočjo novega pristopa celičnih avtomatov

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POVZETEK

Da bi kvantitativno proučili difuzijski proces in vzorce pri skupinskem razvoju izdelkov (CPD), je v tem prispevku predstavljen kvantitativni model difuzije znanja pri CPD na podlagi metode izboljšanih celičnih avtomatov. Na podlagi SIS modela – in za difuzijo znanja pri CPD značilne interakcije lokalnega znanja – so vplivni dejavniki difuzije znanja povzeti v parametrične spremenljivke. Na podlagi izboljšanih celičnih avtomatov za difuzijo znanja CPD je bil zasnovan K-SIS (angl. knowledge-SIS) model. Za proučevanje difuzijskega procesa in vzorcev prehajanja znanja pri CPD je bila izvedena simulacija K-SIS modela. Ta je razkrila mehanizem dejavnikov, ki vplivajo na difuzijo v difuzijskem procesu pri CPD. Rezultati raziskave nudijo dragoceno referenco za izboljšanje učinkovitosti difuzije znanja pri CPD.

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PODATKI O ČLANKU

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