APEM journal

Advances in Production Engineering & Management
Volume 11 | Number 2 | June 2016 | pp 141–151
http://dx.doi.org/10.14743/apem2016.2.216

ISSN 1854-6250
Journal home: apem-journal.org
Original scientific paper

Simultaneous determination of production and shipment decisions for a multi-product inventory system with a rework process

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ABSTRACT

In a turbulent and highly competitive business environment, management always pursues options to reduce overall operating costs. The vendor-buyer integrated system has recently drawn attention from managers, because it can benefit both parties of the supply chain and it is suitable to be applied to a so-called intra-supply chain system within the present-day globalized enterprise. This study attempts to simultaneously determine production and shipment decisions for a multi-product vendor-buyer integrated inventory system with a rework process, wherein multiple products are fabricated in sequence by a single machine under a rotation cycle time policy. All defective items produced in regular production are assumed repairable, and are reworked right after the regular production ends. Finished goods of each product are transported to sales offices/customers after rework. A multi-delivery policy is applied, wherein a fixed quantity of *n* instalments of the finished batch is delivered at fixed intervals during the delivery timeframe. Mathematical modelling and optimization techniques are used to help simultaneously determine the optimal production and shipment decisions that minimize the expected overall system costs. A numerical example is used to show the applicability of our research results.

ARTICLE INFO

Keywords:
Multi-product inventory system
Vendor-buyer integrated system
Intra-supply chain
Common production cycle time
Rework

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Article history:
Received 31 January 2016
Revised 20 May 2016
Accepted 22 May 2016

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APEM journal

Advances in Production Engineering & Management
Letnik 11 | Številka 2 | Junij 2016 | pp 141–151
http://dx.doi.org/10.14743/apem2016.2.216

ISSN 1854-6250
Spletna stran: apem-journal.org
Izvirni znanstveni članek

Simultano določanje proizvodnje in odpreme za večizdelčni sistem zalog z možnostjo dodelav

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POVZETEK

V turbolentnih in visoko konkurenčnih poslovnih okoljih menedžment vselej stremi k zniževanju operativnih stroškov. V zadnjem času menedžerji še posebno pozornost namenjajo integriranemu sistemu dobavitelj-kupec, saj koristi obema stranema v oskrbovalni verigi. Namen prispevka je simultano določanje proizvodnje in odpreme za večizdelčni sistem zalog dobavitelj-kupec z dodelavami, kjer se več izdelkov izdeluje v zaporedju na enem stroju z rotirajočim ciklom. Pomanjkljivi kosi v rednem proizvodnem procesu se upoštevajo kot popravljivi in se dodelajo po končanju redne proizvodnje. V delu sta uporabljeni matematično modeliranje in optimizacija za pomoč pri simultanemu odločanju za optimalne odločitve pri proizvodnji in pri odpremi, kar pripomore k nižjim stroškom delovanja sistema. Podan je številčen primer, ki nakazuje uporabnost naših raziskovalnih rezultatov.

PODATKI O ČLANKU

Ključne besede:
Večizdelčni sistem zalog
Integrirani sistem dobavitelj-kupec
Notranja oskrbovalna veriga
Skupni proizvodni cikel
Dodelava

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Zgodovina članka:
Prejet 31. januarja 2016
Popravljen 20. maja 2016
Sprejet 22. maja 2016