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Classificationofgreensupplychainmanagementdisciplinesandbestpractices:Areview

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ABSTRACT:

Thisarticleaimstoprovideabriefoverviewandclassificationofgreensupplychainmanagementdisciplines and best practices for finding value, conserving resources, eliminating waste, andincreasingproductivityinvariousindustriesgreenoperations,greendesign,greenmanufacturing,reverse logistics and waste management are the main topics in the literature. These issues will bebriefly discussed in this paper. The following is the structure of the remainder of this paper: Thedisciplines of green supply chain management and their classification are discussed in Section 2. Thebenefits and application of green practices are discussed in Section 3. The paper ends with aconclusion.

Keywords:Greensupplychainmanagement,literaturereview,discipline,andbestpractices

1. Introduction:

AccordingtoBeamon(1999),supplychainmanagementhastraditionallybeenviewedasaprocessin which raw materials are transformed into finished goods and delivered to the final consumer. Someof the main factors that have led to the adoption of green practices include new governmentregulations, shifts in consumer attitudes, a limited supply of raw materials and resources, anabundance of waste sites and the pollution they cause, and these factors. According to Nelson andRao (2012), green supply chain management (GSCM) has emerged to address the issues by involvingbusinessesandexpandingtheirenvironmentalresponsibilitiestoSCactivities.

Stakeholders are increasingly holding companies responsible for damage inthe environment createdby their supply chains and putting pressure on firms to extend their environmental responsibilitieswiththeadoptionofGreenSupplyChainManagement(GSCM)practices(Silvaetal.,2021).

In a 1996 study titled "Environmentally Responsible Manufacturing," the Manufacture ResearchConsortium (MRC) of Michigan State University first presented the idea of a "green supply chain." Themain research in this program was "Green Supply Chain Management". A new supply chain designwasproposedbyBeamon(1999)andsomeenvironmentalelementswereincorporatedintoasupplychainmodel.

According to Srivastava (2007), "Green supply chain management" is a type of supply chainmanagementinwhichenvironmentalconsiderationsareincorporatedintovariousstages,includingproduct design and material sourcing, manufacturing, sales, delivery of the final product to

customers,andcareforproductsaftertheyhavereachedtheirend-of-life.

Zhu (2004) says that GSCM businesses collaborate with their upstream and downstream counterpartsto maximize environmental benefits throughout the supply chain—from product design and materialselectiontoretailingandrecycling—andtoachievesustainablesupplychaindevelopment. Green supply chain management includes green practices in purchasing, manufacturing, and materialshandling, distribution, and marketing, as well as reverse logistics, to optimize waste and energyconsumption. Initiatives for packaging and waste reduction, as well as emission reduction, also play asignificantroleinachievingthegoalsofgreensupplychainmanagement(WalkerandMcBain2008, S.Bagetal.(2022)).

Theirbasicreasoningisthatinvestmentsingreeningcanberesource-saving,waste-eliminating,andproductivity-improvingS.S.PanpatilandR.Kant(2022).ThreeapproachesinGrSCM,namelyreactive,proactiveandvalue-seeking,aresuggested.Thekeythemesintheliteraturearegreendesign,greenoperations,reverselogistics,wastemanagement,andgreenmanufacturing(Srivastava,2007).Greensupplychainmanagementaimstopromotethecoordinateddevelopmentofenvironmental,social,andeconomicperformancebyachievingoptimalresourceallocation,increasingeconomicbenefits,andenhancingenvironmentalconsistencythroughoutthproductlifecycle.

2. ClassificationofgreenSupplyChainManagementDiscipline:

The various fields of GSCM, green product design, green purchasing, green production, greenpackaging, green marketing, and green logistics are discussed as potential applications of greenpracticesinthissection.

a. **Greenproductdesign**

It involves a series of actions with the goals of making the factory safer and cleaner, lowering the costofdisposal,reducingtheriskstohealthandtheenvironment,increasingproductqualityat alowercost, improving public image, and increasing productivity. Green design has received more attention(Srivastava,2007)

b. **Greenpurchasing**

Green purchasing is a strategy that makes use of the company's power as a consumer of rawmaterials to help the environment by purchasing goods that have less of an impact on theenvironment. Green purchasing activities can be broken down into the following categories:Buyingstandard oreco-labeledgoodsorservicesthatarelimitedtoacertainlevelofenvironmental performance; evaluating goods or services before purchasing them by in-house orthird-partyevaluators;assistingsuppliersinimprovingtheiroperations,goods,orservices;and(Murray,2000;Zhangetal.,2014,A.R.Al-Bataynehetal.(2021)

c. **GreenManufacturing**

The term "green manufacturing" refers to production processes that produce little or no waste andproducelittleornopollution.Amongthemostcommonwastesthatshouldbeavoidedaredefectivepro ductslikescrapandreworkedmaterials,aswellasoverproducedproductsbecauseofabuild-to-

stock policy. Among the most common pitfalls are unnecessary labor movements during themanufacturing process or holding work-in-process materials, as well as an excessive inventory of rawmaterials. In this category of green activities, eco-friendly materials like green lubricants can also bementioned(Liang,Shaoqiang,2019,Kim,H.,Choi,J.,2013).

d. Greenmarketing

The practice of selling goods based on their positive effects on the environment is known asgreenmarketing.Itispossibleforaproducttobeenvironmentallyfriendlyifitispackagedinaway that is good for the environment or produced using an environmentally friendly method.Greenmarketing,ontheotherhand,hasasignificantimpactonthebuyer'sdecisionanddirect stheir attention to "green" products and services. Targeting, green positioning, green pricing,marketing waste, green promotion, and green alliance are among the major initiatives takingplace in this discipline of GSCM practices (Grundey and Zaharia 2008; F. Rizzi and M. Gigliotti(2022)).

e. Greenlogistics

Green initiatives are applicable in different logistical elements of the SC, from the acquisition of rawmaterialsandinboundandoutboundtransportationtofacilitylocation/buildingdesignandwarehousi ng. There are three main types of environmentally friendly practices in this field: managingthe return flow of waste, minimizing the effects of warehousing on the area surrounding the facilities,andtransportation.Reverselogistics(SrivastavaandSrivastava2006;Minetal.,2006).Howev er,theseexistingresearcharedispersiveandhavenotyetformedasystematizedtheory(Sarkisetal.,2006).

3. BestPracticesinGreenSupplyChainManagement(GSCM):

1. InGSCM,"bestpractices"refertoavarietyofactionstakenbybusinessestolessentheimpactof their SC activities on the environment. The most significant of the company's numerous greeninitiativesisrationalizingitsdistributioncenters,maximizingthetransportationdistance,and reducing the number of trucks. Fujitsu Ltd. is a multi-national IT and consumer electronicscompanyheadquarteredinTokyo,Japan.Thecompany’sgreenactivitieswereinitiallys tartedin 2003, with most of the initiatives being formed around the green logistics area. Thestandardizationoftheshippinginstructionsandamendmentoftheoperatingsystemsaremorete chnical and require considerable expertise. The further reduction of CO_2 emissions via theFujitsulogisticssolutionsystemisanothernotablemissioninthisrespect.
2. The most recent green initiative in Fujitsu is the development of a CO_2 exhaust estimation tool.Decreasing the number of trucks by intensive vehicle-allocation control, installation of in-vehicle terminals in trucks, implementing eco-drive practices, and building an accurate emissioncalculatorintrucks aresomeoftheotherinitiativesinthisregard.

3. Apple'shasthreeprioritiesforgreeninitiatives:
    i. Replacingconventionalenergysourceswithrenewableenergiestoreducetheimpactofclimatechange.
    ii. Usingenvironmentallyfriendlymaterialsinthemanufacturingof Appleproducts
    iii. Conservingpreciousresourcesbyemployingnewproduction/designstrategies
4. Applehasstartedworkingonthreemajorapproachestoreduceitsproduct'senergyconsumption in the green product design discipline: "more efficient power supplies to bringelectricity from the wall to the device", "more efficient hardware", and "smarter powermanagementsoftware".
5. Apple has attempted to minimize the environmental impact of employee commutes, inter-officetrips, and businesstravelthrough greenlogistics initiatives. The company providesallemployeeswithatransit subsidy.
6. Thegreendesignofnewbuildingsandupdatingofexistingfacilitiestoconsidertheirenergyefficiency is probably the most significant greening initiative by the company. The goal istoprovideallthenetworkfacilitieswithenergyfromrenewablesources.
7. *Removing toxins*. Green manufacturing processes can remarkably reduce toxins in products.Appleisapplyingitsstandardstostopusingtoxinsthatpotentiallydangeroustoenvironment.
8. Dellhasaimedatminimizingwastebypersistentlyrefiningtheprocessesandtoolsituses,toomake the most efficient use of air, land, and ocean transportation for receiving supplies,shippingproducts,deliveringservices,andacceptingreturns.
9. Dellhasalsoimplementedmanyinnovativestrategiestominimizeitstransportationactivitiesto decrease fuel consumption and carbon emissions. Dell has also conducted ContainerOptimizationinitiativestoimprovetheprocessesforpalletbuildingandtrailerloading.
10. Initspackagingdepartment,Dellusesbamboopackagingforlightweightconsumerproductsandmushroom-basedpackagingforheavierproducts.Theyhavealsoattemptedtoreducethevolumesofpaperusedintheshippingofproductsthroughgreendesignandpackaging.
11. Dellhasalsoestablishedinitiativestorecyclepackaging/protectivedunnageineachregionallogisticcenter.
12. Dellcollaborateswithitspartnersinvariouswaystoformgreenpurchasinginitiatives.Theyoutsourced their shipment activities to logistics and transportation companies such as DHL,FedEx,andUPS,whichareknowntooffereco-friendlyactivities.
13. Replacingconventionalfuelswithbiofuelsources isalsocontributingalottothecompany'senvironmentallyfriendlyperformance.
14. Electronically transmitting the shipping documents as well as using recycled cardboard dunnageforthenecessarypaperworksistheotherremarkablegreenpracticeinDell.

15. DHL hasassignedabudgettoreducethecarbonfootprintofitsfacilitiesbyreplacingitslighting

and energy control systems, applying energy efficiency standards in the green design andconstruction of new buildings, and the installation of modern supplements for the use ofsustainableresources.

16. The installation of a photovoltaic system with solar cells and the utilization of an innovativesystem to collect and store rainwater to cover a considerable amount of the facility's waterneedsarejustsomeexamplesintheabove-mentionedarea.

In the future, it is expected that all companies will need to implement strategies to reduce theenvironmentalimpactsoftheirproductsandservices.

4.Conclusion

Thegreensupplychainisaninnovativesupplychainwithsocialdevelopmenttrends.Itintegrateseconomic performance, environmental performance, and resource efficiency into the entire spectrumof supply chain activities involving raw materials and component purchasing, manufacturing,packaging,distribution,retailing,andthesubsequentrecyclingoftheproducts.Thisbrief reviewofGSCM practices disclosed the superiority of implementing green practices, particularly in themanufacturingarea. Greensupply chain management aims to promote the coordinated developmentofenvironmental,social,andeconomicperformanceswithanemphasisongreenthetransformationofthewholeproductlifecyclewhileminimizingresourceconsumptionandenvironmentalimpactandatthesametime,pursuingeconomicbenefits.

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