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Articles are published in Uzbek, Russian, and English, ensuring a wide-reaching audience and fostering cross-cultural academic exchange. As a beacon of academic excellence, the "Journal of Transport" continues to serve as a vital conduit for knowledge dissemination, collaboration, and innovation in the transport sector and related fields.

The current state of terminal and logistics technology in Uzbekistan and its development

M.A. Kabulov¹ ^a

¹Fergana state technical university, Fergana, Uzbekistan

Abstract: The article examines the current state of terminal logistics technologies in Uzbekistan. The analysis of the infrastructure and technical parameters of the terminals was carried out, the degree of digitization of logistics processes and the influence of geopolitical and economic factors were assessed. Based on the problems identified as a result of scientific research, ways to improve terminal logistics systems are proposed, taking into account international trends and national strategies.

Keywords: terminal and warehouse complex management, transport and logistics center, development, transport, warehouse, terminal

O'zbekistonda terminal-logistika texnologiyasining hozirgi holati va uning rivojlanishi

Qobulov M.A.¹ ^a

¹Farg'ona davlat texnika universiteti, Farg'ona, O'zbekiston

Annotatsiya: Ushbu maqolada O'zbekistondagi terminal-logistika texnologiyalarining hozirgi holati ko'rib chiqilgan. Terminallarning infratuzilma va texnik parametrlari tahlillari olib borilgan, logistika jarayonlarini raqamlashtirish darajasi va geosiyosiy va iqtisodiy omillarning ta'siri baholangan. Ilmiy izlanish natijasida aniqlangan muammolar asosida xalqaro tendentsiyalar va milliy strategiyalarni hisobga olgan holda terminal-logistika tizimlarini takomillashtirish yo'llari taklif etilgan.

Kalit so'zlar: terminal-ombor kompleksini boshqarish, transport-logistika markazi, rivojlanish, transport, ombor, terminal

1. Kirish

Hozirgi vaqtda O'zbekistonda va ko'plab mamlakatlarda logistika faqat yuklarni tashish bilan bog'liq ba'zi funktsiyalar to'plami sifatida qabul qilinmoqda. Shu bilan birga, rivojlangan mamlakatlarda biznes yuritish amaliyoti shuni ko'rsatadiki, logistika savdo oqimlarini tashkil qilishda strategik muhim rol o'ynaydi. Jahon amaliyotida mintaqaviy yuk tashish tizimlarini shakllantirishning eng keng tarqalgan tamoyillaridan biri bu shahar atrofidagi yirik shahar aglomeratsiyalari atrofida terminal komplekslarini yaratishdir [1].

Terminal-logistika texnologiyalarining rivojlanishi har qanday davlatning transport-logistika tizimining barqaror va samarali ishlashini ta'minlashda muhim rol o'ynaydi. O'zbekiston uchun faol tranzit salohiyatiga ega mamlakat sifatida logistika markazlarini modernizatsiya qilish va jarayonlarni raqamlashtirish masalalari ayniqsa dolzarbdir [2].

O'zbekiston Respublikasining geografik joylashuvi ishlab chiqarish va savdo kompaniyalarining yuklarni yetkazib berish bo'yicha logistika xarajatlarini minimallashtirishi mumkin bo'lgan zamonaviy ombor komplekslari va savdo infratuzilmasining logistika markazlari tarmog'ini rivojlantirishning strategik muhim jihati va rag'batlantirishidir [3].

Adabiyotlar tahlili. Terminal-logistika tizimlarini rivojlantirish masalalari ilmiy adabiyotlarda ham xalqaro, ham milliy tadqiqot muhitida faol ko'rib chiqilmoqda. Zamonaviy tadqiqotlar logistika jarayonlarini avtomatlashtirish, logistika zanjirlarini raqamlashtirish, aqlli transport tizimlarini joriy etish va samarali multimodal infratuzilmani shakllantirishda terminal komplekslarining roliga qaratilgan.

Masalan, R. Ballou, K. Kristofer va D. Lambertning ilmiy ishlarida ta'minot zanjirini boshqarish axborot tizimlarini (SCM) terminal-logistika infratuzilmasi bilan integratsiya qilish muhimligi ta'kidlangan. Ularning fikriga ko'ra, logistika terminallari nafaqat yuklarni qayta ishlash ob'ektlariga, balki yuqori darajadagi raqamlashtirishga ega intellektual tizimlarga aylanadi [4].

Birlashgan Millatlar tashkilotining savdo va taraqqiyot dasturi (UNCTAD) doirasida olib borilgan tadqiqotlar shuni ko'rsatadiki, logistika samaradorligi darajasi to'g'ridan-to'g'ri logistika terminallari sifatiga va ularning temir yo'l, avtomobil va havo infratuzilmasiga ulanish imkoniyatlariga bog'liq. Jahon bankining (LPI — Logistics Performance Index) hisobotlariga ko'ra, logistika markazlari rivojlangan mamlakatlarda yetkazib berish muddati va logistika xizmatlari narxi ancha past [5].

Markaziy Osiyo, shu jumladan O'zbekiston kontekstida mintaqaviy logistika bo'yicha tadqiqotlar faol nashr etilmoqda. Masalan, A. Abdullayev va X. Tursunov ilmiy izlanishlarida O'zbekiston yuqori tranzit salohiyatiga ega ekanligi qayd etilgan, ammo bu salohiyatni amalga oshirish

 <https://orcid.org/0000-0002-0074-5497>



1-jadval

Yuk tashish parametrlari

Ko'rsatkich	O'zbekiston bo'yicha o'rtacha qiymat	Eng yaxshi xalqaro amaliyotlar
Qayta ishlash vaqti 1 TEU (soat)	4,5	1,5–2
Omborxonalarni avtomatlashtirish darajasi (%)	20	>60
Bir vaqtning o'zida ishlangan yuklar soni	300–500	1000–2000

Mamlakatdagi zamonaviy terminallar turli darajada jihozlangan:

- Terminallarning atigi 15% da RFID tizimlari mavjud;
- 10% dan kam avtomatlashtirilgan saralash liniyalaridan foydalanadi;
- Terminallarning 70% dan ortig'i esa jismoniy mehnat orqali ishlaydi.

2. Tadqiqot natijalari

Mamlakatda terminal logistikasini rivojlantirishning asosiy yo'nalishlaridan biri raqamli platformalarni joriy etish hisoblanadi. Raqamli texnologiyalar vazirligi tomonidan amalga oshirilayotgan "Milliy logistika" platformasi loyihasi hali tugallanmagan jarayonda. Hozirgi vaqtda jahon tajribalarida amalda qo'llanilib kelayotgan TRACECA va BRI platformalari bilan integratsiya qilish, transportni real vaqt rejimida kuzatish va tashuv jarayonlarning shaffofligini oshirish imkonini beradi. Terminal-omborlarda yuk taqsimoti jarayonini optimallashtirish va ishlov berish vaqtini qisqartirish vositasi sifatida AI va Big Data texnologiyalariga asoslangan WMS/TMS innovatsion tizimlarini joriy etish dolzarb masalaning yechimi hisoblanadi [12].

Geoiqtisodiy va strategik jihatlarni hisobga olgan holda, O'zbekiston muhim xalqaro transport yo'laklari kesishgan joyda joylashgan, masalan:

- Xitoy – Markaziy Osiyo – Yevropa ("Bir makon-bir yo'l" tashabbusi);
- Shimoliy-Janubiy koridor (Rossiya-Eron-Hindiston);
- Transafg'on transport koridori.

Ushbu marshrutlar 24/7 kun davomida yuk tashish, yuqori darajadagi axborot almashinuv jarayon sinxronizatsiyasi, xalqaro standartlarga moslashuvni (masalan, FIATA, UN/CEFACT) ta'minlay oladigan yuqori samarali logistika markazlarini talab qiladi (2-jadval) [12].

2-jadval

Rivojlanishdagi muammolar va to'siqlar

Muammolar	Yechimlar
Investitsiyalarning yetishmasligi	DXSh mexanizmlari, xalqaro kreditlar
Malakali kadrlarning yetishmasligi	Logistlar va IT mutaxassislarini tayyorlash dasturlari
Ma'lumotlar standartlarining yetishmasligi	UN/EDIFACT va XML almashtiruv standartlarini joriy etish
Cheklangan tahlil va prognozlash	Mashinani o'rganish va bashoratli tahlildan foydalanish

quruqlik portlarni modernizatsiya qilish, tarqatish markazlarini tashkil etish va logistika boshqaruvining aqlli tizimlarini joriy etishni talab qiladi [6].

Shuningdek, Sh.Ergashev va F. Umarov kabi mahalliy tadqiqotchilarning xalqaro transport yo'laklarining (TRACECA, BRI) O'zbekistonning logistika infratuzilmasini rivojlantirishga ta'sirini tahlil qilishga qo'shgan hissasini ham ta'kidlash joiz. Ular milliy logistika terminallarini raqamli savdo va xalqaro sertifikatlash standartlariga moslashtirish zarurligini ta'kidlaydilar [7].

Ilmiy adabiyotlarda raqamli transformatsiya masalalariga alohida e'tibor qaratilmoqda. Shuningdek, H.Li va S.Vang asarlarida IoT, AI va Big Data texnologiyariga asoslangan intellektual logistika markazining modeli keltirilgan. Bunday modellar tegishli infratuzilma va dasturiy bazaga ega bo'lgan holda O'zbekiston sharoitlariga moslashtirilishi mumkin [8].

Shunday qilib, ilmiy adabiyotlar tahlili shuni ko'rsatadiki, terminal-logistika texnologiyalarining muvaffaqiyatli rivojlanishi tizimli yondashuvni talab qiladi [9]:

- infratuzilmani modernizatsiya qilish;
- jarayonlarni raqamlashtirish;
- kadrlar bilan ta'minlash;
- faol xalqaro hamkorlik.

1. Tadqiqot metodologiyasi

Ushbu tadqiqot maqsadlariga erishish uchun tizimli tahlil, qiyosiy tahlil elementlari, shuningdek amaliy logistika modellashirish elementlarini o'z ichiga olgan kompleks uslubiy yondashuvdan foydalanildi. Asosiy e'tibor O'zbekistonning terminal-logistika ob'ektlarining joriy texnik va tashkiliy xususiyatlarini aniqlashga, shuningdek, xalqaro standartlar bilan qiyosiy tahlil qilishga qaratilgan.

Normativ va strategik hujjatlarni tahlil qilish orqali O'zbekistonning transport logistikasi sohasidagi davlat dasturlari (shu jumladan, 2021-2025 yillarga mo'ljallangan transport-logistika infratuzilmasini rivojlantirish dasturi), transport vazirligi, davlat statistika qo'mitasi ma'lumotlari, shuningdek, xalqaro tashkilotlarning hisobotlari (UNCTAD, LPI, TRACECA) o'rganildi [10].

Terminal logistika tizimi - bu turli xil transport turlari o'rtasida tovarlarni qayta ishlash, vaqtincha saqlash va qayta taqsimlashni ta'minlaydigan texnologik, tashkiliy va axborot jarayonlari majmuidir. Bunday tizimning asosiy elementlari logistika terminallari (quruq portlar), tarqatish markazlari, omborlar, avtomatlashtirilgan logistika boshqaruv tizimlari (WMS, TMS) va axborot-tahliliy modular hisoblanadi [11].

O'zbekistonda 30 dan ortiq yirik logistika markazlari va terminallari, jumladan, xalqaro quruq portlar mavjud:

- "Angren" logistika markazi;
- "Termiz-Cargo Terminal" xalqaro logistika markazi;
- Xalqaro aeroportdagi "Navoiy" quruq porti.

Biroq, O'zbekiston Respublikasi Transport vazirligi ma'lumotlariga ko'ra, mazkur obyektlar salohiyatidan foydalanish darajasi 60 foizdan ham kam. Biroq asosiy muammolar saqlanib qolmoqda:

- Tashuvlar jarayonini avtomatlashtirish darajasining yetarli emasligi;
- Ta'minot zanjiri integratsiyasi uchun cheklangan raqamli platformalar;
- Multimodal yo'nalishlardagi to'siqlar.

Logistika terminallarining texnik tahlili va terminallarning samaradorligini baholash uchun tahliliy ko'rsatkichlar quyidagi jadvalda o'z aksini topgan (1-jadval).



O'zbekiston Respublikasi transport vazirligi ma'lumotlariga ko'ra, 2024 yilga kelib mamlakatda turli darajadagi 15 dan ortiq logistika terminallari, shu jumladan Navoiy, Termiz va Angrendagi xalqaro logistika markazlari faoliyat ko'rsatmoqda.

Ko'pgina terminallar cheklangan raqamli boshqaruv imkoniyatlariga ega, ularning atigi 35 % avtomatlashtirilgan omborlarni hisobga olish tizimlaridan (WMS) foydalanadi va taxminan 20 % Real vaqtda monitoring tizimlaridan foydalanadi.

Yuk tashish jarayonlarini konteynerizatsiyasi darajasi 15% dan kam, bu Iqtisodiy hamkorlik va taraqqiyot tashkilotidagi (OECD) mamlakatlarining o'rtacha ko'rsatkichidan past (35-40%).

Xalqaro transport va logistika xizmatlari bozorida tobora kuchayib borayotgan raqobatni hisobga olgan holda, xalqaro yuk tashishni amalga oshiradigan transport kompaniyalari uchun ISO 9001:2008 bo'yicha sertifikatlashtirish majburiydir, chunki ushbu standartga muvofiqligi boshqaruv tizimi va tashkilotining ratsionalligi va samaradorligini belgilaydi.

Avtotransport vositalarida sifat menejmenti tizimining barqaror rivojlanishiga erishish uchun sifat menejmenti tizimi bo'yicha milliy kadrlarni tayyorlash va tayyorlashni tashkil etish kerak (ISO9001:2008). Shuningdek, transport va ombor logistikasi sohasida mutaxassislarni tayyorlash va malakasini oshirish uchun trenerlar tayyorlashni tashkil etish zarur.

3. Xulosa

O'zbekistonda terminal-logistika texnologiyalarini rivojlantirish milliy iqtisodiyotning raqobatbardoshligini oshirish va transport tranzit salohiyatini ro'yobga chiqarishning kalitidir. Zamonaviy muammolar infratuzilma, raqamli va kadrlar yechimlarini birlashtirgan tizimli yondashuvni talab qiladi. Faqatgina bu holatda respublika Yevro Osiyo logistika xaritasida yetakchi o'rinlarni egallashi mumkin.

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Mualliflar to'g'risida ma'lumot/ Information about the authors

Qobulov	Farg'ona davlat texnika universiteti
Maxammadjon	tayanch doktranti
Alijon o'g'li /	E-mail: m.a.qobulov@ferpi.uz
Kabulov	Tel.: +998 90 408 4009
Makhammadjon	https://orcid.org/0000-0002-0074-5497
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