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УЯВЛЕННЯ ПРО ФЕНОМЕН БОЙОВОГО ПОБРАТИМСТВА В УКРАЇНІ (1914 – 2014 рр.)

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PERCEPTIONS OF THE PHENOMENON OF COMBAT FRATERNITY IN UKRAINE (1914 – 2014)

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Анотація

У статті висвітлено питання трансформації феномену бойового побратимства серед українських воїнів з Першої світової війни і до початку російсько-української війни у 2014 році. Авторка розглядає різні періоди та обставини, за яких формувався феномен побратимства та що впливало на його трансформацію. Також авторка звертає увагу на негативний вплив радянського режиму на феномен бойового побратимства, а саме в часи Другої світової війни та військової інтервенції Радянського Союзу в Афганістан у 1979-1989-х роках. Також у статті розглянуто період початку незалежності України та проаналізовано передумови формування феномену бойового побратимства в сучасному періоді – російсько-українській війні, що триває з 2014 року. Авторка у статті наводить приклади традицій бойового побратимства, які збереглися і по нині. Це і визначає актуальність нашої теми. Мета статті – з'ясувати особливості поняття бойового побратимства в різні періоди історії. Об'єктом дослідження є українське побратимство в період від початку XX ст. по 2014 рік, а предметом – уявлення про побратимство в різні періоди та трансформація цього поняття. Методологічною основою дослідження є міждисциплінарний підхід, який суттєво розширює межі дослідницьких перспектив. Територія дослідження охоплює всю сучасну територію України. Хронологічні межі дослідження: від початку XX ст. (українці в арміях Австро-Угорщини, російської[1] імперії) – і по 2014 рік (до початку російсько-української війни). Джерельною базою роботи стали опубліковані та неопубліковані усноісторичні джерела, періодичні видання, засоби масової інформації, монографії.

Abstract

The article highlights the transformation of the phenomenon of combat brotherhood among Ukrainian soldiers from the First World War to the beginning of the Russian-Ukrainian war in 2014. The author considers various periods and circumstances under which the phenomenon of twinning was formed and what influenced its transformation. The author also draws attention to the negative influence of the Soviet regime on the phenomenon of combat twinning, namely during the Second World War and the military intervention of the Soviet Union in Afghanistan in 1979-1989. The article also examines the period of the beginning of Ukraine's independence and analyzes the prerequisites for the formation of the phenomenon of combat fraternity in the modern period – the Russian-Ukrainian war, which has been ongoing since 2014. In the article, the author cites examples of traditions of martial brotherhood that have survived to this day. This determines the relevance of our topic. The purpose of the article is to find out the specifics of the concept of martial brotherhood in different periods of history. The object of the study is the Ukrainian fraternity in the period from the beginning of the 20th century. To 2014, and the subject is the idea of fraternity in different periods and the transformation of this concept. The methodological basis of the research is an interdisciplinary approach, which significantly expands the boundaries of research perspectives. The territory of the study covers the entire modern territory of Ukraine. Chronological boundaries of the study: from the beginning of the 20th century. (Ukrainians in the armies of Austria-Hungary, the Russian Empire) – and until 2014 (before the start of the Russian-Ukrainian war). The source base of the work became published and unpublished oral history sources, periodicals, mass media, and monographs.

Ключові слова: бойове побратимство, Перша світова війна, Друга світова війна, війна в Афганістані 1979-1989, Українська повстанська армія, Українські січові стрільці, війна, воїн.

Keywords: combat brotherhood, the first world war, the second world war, the war in Afghanistan 1979-1989, Ukrainian Insurgent Army, Ukrainian Sich riflemen, war, warrior.

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[1] Усі власні назви держави-агресора означаю з маленької букви – авторка.

Вступ.

В умовах війни формуються унікальні відносини між воїнами – бойове побратимство, яких в цивільному та мирному житті ніколи не знайти. З часів Першої світової війни і до початку незалежності України можна простежити, як феномен бойового побратимства формувався та як змінювався. Україна в цей період пережила дві світові війни, національно-визвольну боротьбу та радянський терор. Так само за цей час українці опинялись в ситуації, коли доводилось воювати в лавах різних країн в один період, так, наприклад, українці опинялись по різні сторони барикад в часи Першої та Другої світових війн, воюючи на боці чи то Російської імперії, Австрійської імперії, чи на боці Радянського Союзу, Німеччини (дивізія «Галичина»), чи окремо боролась за власну незалежність як Українська повстанська армія.

Перебуваючи у різних арміях, українці формували традиції побратимства, вшанування пам'яті своїх полеглих в бою братів. Більшість з тих традицій трансформувались і використовуються і по нині в сучасній російсько-українській війні. Багато з них йдуть своїм корінням в часи козаччини. Разом із формування нових традицій бойового побратимства слід розглядати і обставини занепаду цього явища в часи радянського режиму: в часи Другої світової війни та воєнної інтервенції Радянського Союзу в Афганістан.

Останнім період, розглянутим в статті є початок Незалежності України, відновлення уявлення про бойове побратимство серед українських військовослужбовців, які брали участь у миротворчих місіях. Досвід українських миротворців став у нагоді з початком російсько-української війни у 2014 році, яка триває і по нині.

Основна частина.

Пишучи про війну, на думку часто спадають такі поняття як кров, бруд, біль, страх. Але також війна – особливе середовище, де формуються окремо від цивільного життя норми поведінки серед солдатів. Одним із таких є бойове побратимство. Розглянемо визначення цього поняття з "Української малої енциклопедії": "Бойове побратимство – установа звичаєвого права, духовне споріднення, індивідуальна взаємопідтримка, відома з давніх часів (в Україні зі скіфських часів). Побратимство вважалося за нерозривне і зобов'язувало навіть більше, ніж звичайне споріднення: побратима не можна було зрадити, не допомогти йому в біді, навіть якщо власному життю загрожувала небезпека. Побратим мусив піклуватися про родину покійного побратима, як про свою власну" [1, с. 1404–1405].

Бойове побратимство є надзвичайно важливим елементом під час війни. Саме консолідація, об'єднання солдатів спільною ідеєю підвищує моральний дух в умовах війни. Консолідацію воїнів навколо спільної ідеї можна порівняти зі створенням українського козацтва, ще Михайло Максимович називав українське козацтво "однодумним громадянським суспільством" [2, с. 165]. У ті часи ідеєю,

навколо якої об'єдналися козаки, була державність, загроза втрати своєї національної самобутності, сьогодні ми переживаємо схожі ризики: страх втратити тільки-но відновлену незалежність, збереження своєї національної самобутності.

Про звичай побратимства в часи Першої світової війни ми можемо прочитати у спогадах вояків. У 65-му Мішкольцькому піхотному полку українські вояки з радістю і теплотою віднеслися до своїх нових побратимів, про це свідчить стаття у польовій газеті полку "Ludwig baka" за 15 квітня 1918 р.: *"Ми втратили III і IV батальйони, які стали кістяком нового 134-го піхотного полку. Незважаючи на це ми не залишилися знекровленими, адже на місце двох втрачених гілок до пошматованого дерева була прикріплена нова життєдайна гілка – до тих пір самостійного II батальйону 66-го полку. Наша щира радість через Вашу присутність є доказом Вашої відваги, адже людвиківці не піднімають бокал за будь-кого. Дорогі нові побратими, які протягом трьох жахливих років хоробро воювали з підступними італійцями, тепер ви прийшли, щоб полонити нас. Повірте нам, що це була найкраща Ваша перемога, адже це тріумф братерства і любові. Ваша назва II/66 і так вже в дужках вказується біля вашої нової назви III/65. Наша домівка вже і ваша, яку ми ділимо з вами, як побратими. На сторінках нашої газети, котра відтепер і ваша, зберіть у лавровий вінок усе, що можете розказати про свої бої та фронтові події. Якомога краще пізнавши один одного, ми разом зможемо вирушити в останній переможний бій, що здобув би нам Божу милість"* [3, с. 160].

У 2021 р. Служба безпеки України оприлюднила справу старшини армії Української Народної Республіки, розвідника Семена Могили, який врятував побратимів з бою під Крутами у 1918 р.: "На момент наступу військ Муравйова на Київ йому був лише 21 рік. Але ще до початку бою на станції Крути його підрозділ захопив у полон кілька червоноармійців. Після запеклого протистояння з 4-тисячною армією більшовиків Могила евакуював всіх поранених бійців своєї сотні", – йдеться у справі. Воїн також брав участь в антибільшовицькій боротьбі на Херсонщині, а у 1920 р. – у Першому Зимовому поході. У 1923 р. бійця схопили під час перетину польсько-радянського кордону. Під час допиту більшовиками Семена примушували до співпраці, але він не порушив присягу. Українського воїна розстріляли у Харкові в ніч з 22 на 23 березня 1924 р. [4].

Хорунжий Армії УНР Сергій Ілляшевич під час Першої світової війни служив у 15-му фінляндському пішому полку російської імператорської армії, в самій російській армії був від квітня 1916 року до грудня 1917 року, де здобув старшинський (офіцерський) ступінь підпоручника[2], а вже з кінця 1917 року вступив до української армії. Він воював у складі Запорозької дивізії, створеної Петром Болбочаном. Вони ж звільнили Харків весною 1918 року від московських окупантів-більшовиків, наступні

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[2] Аналог сьогодні у ЗСУ – молодший лейтенант.

місяці тримали державний кордон на Слобожанщині від постійних атак росіян. СергійІлляшевич служив у курені низових запорожців на чолі із Василем Недайкашею, який згодом став визначним українським контррозвідником. Курінь, в сучасному розумінні батальйон, вирізнявся своєю завзятістю та не знав жалю до ворога. Командир "Чорних Запорожців" відзначав згуртованість куреня, їхню єдність: *"Курінь був славний у нашій армії – його знали всі! Знали й більшовики… способи воювати по-партизанському завжди застосовували, де тільки хоч трохи можна було. Хоч кажуть, що один у полі не воїн, та до Низових це прикласти не можна, бо Низові були повним запереченням цього твердження. Билися вони добре і гуртом, і поодинці – кожен із них був бойовою одиницею й сам собі командир"* [5].

Військове формування кавалерії армії Української Народної Республіки "Чорні запорожці" ("чорношличники") стало елітним підрозділом. Командир полку Петро Дяченко виховував своїх підлеглих на традиціях Запорозької Січі. Для своїх підлеглих намагався бути прикладом і був надзвичайно до них вимогливий: *"Той, хто старався ухилитися від вимог командира, довго в лавах "чорних" не затримувався. Не було, здається, бою, у якому б "чорношличники" не брали участі та не виходили переможцями. І він, як отой капітан, що в разі катастрофи останній сходить з командного містка, – завжди останнім відходив із поля бою… Хто не бачив атаки "чорних", той не може собі уявити і відчути стихійності тиску їхніх списів і шабель. Тому не дивно, що жоден ворог не витримував атаки "чорних""*, – писав генерал-хорунжий Армії УНР Петро Самутин [6]. У своїх спогадах Петро Дяченко згадує про ставлення до поранених побратимів під час боїв на Чернігівщині. Він зазначає, що "поранених не кинемо, а будемо боронити далі, пробиватись будуть кіннотники, які спровадять (приведуть) поміч, а ми до того часу протримаємося, набоїв у нас досить" [7, с. 24].

Пам'ять про побратимів армії УНР вшановувалась на місці поховання бійців. Одним із цвинтарів, де проводили вшанування пам'яті, була Козацька могила в Александрові-Куявському, де було поховано 17 вояків Дієвої Армії УНР, поселених у грудні 1920 р. в таборі інтернованих № 6, які померли під час проживання в ньому. На цвинтарі українські емігранти, які перебували в Польщі, влаштовували релігійні та патріотичні урочистості. 29 травня 1927 р. тут вперше було відправлено панахиду за Симона Петлюру, відтоді такі урочистості стали традицією і для інших учасників боротьби за незалежність України [8].

Велика роль в успішних військових операціях відіграє саме побратимство. Наприклад, дружні стосунки, перевірені часом і їх вплив на формування військових формувань можна простежити під час польсько-української війни. Командант 1-го полку УСС Зенон Носковський просив Генштаб армії ЗУНР про об'єднання раніше розділених частин

його військового формування, адже *"УССтрільці від початку свого існування боролися разом…Таке розкинення 1-го полку УСС може сумно вплинути на цю одиноку, дотепер добре зорганізовану і дисципліновану більшу частину У.А. і обнизити її боєву вартість"* [9, с. 52].

Під час битви під Бродами у 1944 р.[3] німецькі війська залучили українських вояків. Результатом битви стала поразка німецьких сил. Українські очевидці причиною поразки вважають недостатню підготовку для подібних операцій також те, що дивізію було сформовано в умовах виразно програної війни німців і майже повного виснаження Німеччини [10, с. 143]. Українські вояки в лавах дивізії "Галичина" діляться досвідом впливу падіння морального духу на настрої інших вояків, побратимів: *"Коли ще йде про психіку та мораль нашого вояка, то не можна оминути факту у високій мірі негативного впливу втікаючих, побитих мас німецького війська, часом просто дезертирів та ще й закликаючих до наслідування їхнього прикладу"* [10, с. 144]. Вояки дивізії наголошують, що важливу роль в їх об'єднання та підтримці бойового духу відіграв сотник Дмитро Паліїв, який працював в дивізії у штабному відділі VI як старшинський референт і був зв'язковим Дивізії до Військової Управи. Фелікс Кордуба розповідає, що Паліїв був дуже висококваліфікованим, свідомим громадянином, показував хороший приклад гармашам, шанував усі вояцькі чесноти. Він впливав на формування дружніх відносин, намагався прищепити розуміння воякам, що тільки залізом та кров'ю можна відвоювати втрачену державність. Він був одним з учасників визвольних змагань 1917–1920 рр. і намагався цей досвід передати воякам Дивізії [10, с. 170].

Вояки УПА, так само як і сучасні українські воїни, вирізнялися теплим ставленням до тварин, які ставали для них чотирилапими побратимами. Наприклад, на постої стрілець УПА Василь Білінчук на псевдо "Сибіряк" (через втечу із заслання в Сибіру) нагодував ведмежа пляшкою молока. Після цього ведмежа прив'язалося до партизанів, постійно їх супроводжуючи. Під час зимових переходів, Василь Білінчук, аби не лишати чотирилапого друга, який перебував у сплячці, носив його на собі [11].

Для повстанців найважчим на фронті були втрати побратимів. Загиблих вшановували мовчанкою або пам'ятною промовою. Якщо тіла побратимів не знаходили на полі бою одразу, тоді віддавали шану заочно, пізніше тіла знаходили й ховали. Керівництво завжди дбало про пам'ять полеглих бійців. Старшини відділу складали "листки впавших на полі слави", де зазначалась біографія, бойовий шлях, місце і причина загибелі, а також місце поховання. В цих записах ім'я полеглих та дата народження були зашифровані. Пізніше документи відправлялись до центрального архіву ВО-6 "Сян". Це було необхідно для увіковічення пам'яті про воїнів для майбутніх поколінь. Під час бою повстанці ча-

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[3] Відбулася з 13-го по 22-е липня 1944 року між 13-м корпусом 1-ї танкової армії Вермахту, до складу якої

входила 14-та гренадерська дивізія зброї СС "Галичина", та радянськими військами 1-го Українського фронту

сто намагались вивезти як поранених, так і полеглих бійців у безпечне місце. Полеглих бійців могли подавати на посмертне нагородження бронзовим або срібним Хрестом Бойової Заслуги. Метою було не тільки вшанування пам'яті полеглим, але й дати приклад для живих бійців, що в разі їх загибелі, про них пам'ятатимуть, а їх "героїчна смерть" буде відзначена. Загиблих воїнів ховали окремо від цивільних на власних цвинтарях в прихильних чи підконтрольних місцевостях. Біля могили повстанці схиляли коліно, віддавали шану, тихо співали повстанських пісень: "З весною поправляємо могили друзів. Садимо в головах калину, берізки, обгороджуємо березовими парканцями й залишаємо вільне місце для нових жертв", – згадував командир "Хрін" через кілька років. Втрата побратимів змушувала задуматись над власною долею, повстанці відчували, що кожен полеглий побратим – це частина усієї спільноти визвольного руху, кожен відчував, що може бути на місці загиблого. Вояки намагались не зосереджуватись постійно на втратах, намагались продовжувати жити та сміятись після болючих втрат: *"Час-від-часу веселий настрій переривають спомини про дорогих друзів-героїв, яким доля призначила віддати життя на полі слави"* [12, с. 246–248].

Повстанці часто підтримували контакти зі своїми рідними, коханими, а також побратимами за допомогою листівок. Таким чином і підвищували бойовий дух. Святкові листівки часто друкували на друкарських машинках і прикрашали нескладними візерунками. Листівки, які відправлялись за кордон і розповсюджувались серед української діаспори, щоб нагадати про підпільну боротьбу українського народу за свою незалежність, а також для збору коштів на підтримку повстанської боротьби [13].

Українська повстанська армія стала взірцем національної свідомості, міцності бойового духу, а також побратимства для сучасних воїнів. 2 серпня 2023 р. в столичному будинку профспілок відбулась презентація книги Романа Коваля "Мого побратима зачепила куля вражая". Вона присвячена п'ятьом загиблим воїнам, які боролись за незалежну Україну в російсько-українській війні з 2014 р.: Тарасу "Хамеру", Дмитру "Да Вінчі" Коцюбайлу, Андрію "Татарину" Жованику, Олегу "Куму" Куцині та Георгію "Жора" Тарасенку. Книга стала доповненням до історії меморіалу, побудованому в червні 2023 р. в Холодному Яру. *"Ці люди надихалися подвигом Холодноярських героїв і героїв Української Повстанської Армії. Дехто з них є і нащадком, як "Да Вінчі" – правнуком вояка УПА. У "Хамера" прадід був у Січових Стрільцях. І ця тяглість поколінь – це дуже сильно. Тому, звичайно, для них, саме Січові Стрільці, вояки УПА і холодноярці були тими, хто надихав їх до боротьби"*, – каже Роман Коваль [14].

У часи Другої світової війни радянська армія гуртувала своїх вояків, серед яких були й українці, не тільки шляхом тотальної пропаганди проти спільного ворога (ще вчорашнього союзника Сталіна – Гітлера і нацистів) – "фашистів", але й репресіями. Застосування репресій та примусових методів

і засобів були основою політики Сталіна та радянського режиму загалом. У виступі вождя 3 липня 1941 року по радіо він намагався виправдати поразки армії й наголосив, що країна у великій небезпеці: "Необхідно, далі, щоб у наших лавах не було місця скиглям і боягузам, панікерам і дезертирам… Ми повинні організувати нещадну боротьбу з усякими дезорганізаторами тилу, дезертирами, панікерами, поширювачами чуток, знищувати шпигунів, диверсантів, ворожих парашутистів… Потрібно негайно віддавати до суду військового трибуналу всіх тих, хто своїм панікерством і боягузтвом заважає справі оборони, незважаючи на особи" [15, с. 397]. Вище командування в перші роки війни не розуміло причин відступу своїх військ, панічних настроїв та дезертирства. Одним із методів наведення порядку було застосування зброї. Один з учасників війни, військовий юрист О. Долотцев писав, що покарання розстрілами набуло широкого розмаху: "Багато розстрілювали, – зазначає він. Ще й як розстрілювали! Потім навіть прийшло роз'яснення, що не можна занадто часто і так необґрунтовано застосовувати трибуналами вищу міру… Що стосується нас, то щомісяця ми розстрілювали чоловік 25–40. Це я згодом, коли підрахував, жахнувся. Перед строєм стріляли не всіх – явних. З представниками від частин і при новому поповненні. І зразу ж мітинг: "Краще чесно скласти голову, ніж померти від своєї кулі, як собака!"" [15, с. 398–399]. У своїх постановах та зверненнях до військовослужбовців, командирів, вище командування завжди намагалось акцентувати на "героїзмі" солдатів на полі бою, і окремо писали, що є випадки панічних настроїв та дезертирства, і що з цим треба боротися. Поруч із дезертирством та панічними настроями радянська машина боролась зі шпигунством, а також негативно ставилась до здачі в полон солдат противнику. Органи НКВС перевіряли колишніх полонених на предмет вербування ворогом агентами, шпигунами. Таких солдатів відправляли у трудові табори, які дуже були схожими на умови ГУЛАГу, пізніше після ретельної перевірки й таборів декого з тих бійців могли відправляти у штрафні батальйони, в яких мали "кров'ю змити" незаслужені звинувачення у зраді [15, с. 401–402].

Згуртованість серед українського населення в часи Другої світової війни була пов'язана з окупацією нацистською Німеччиною. В цьому випадку побратимство більше проявлялось серед учасників партизанського руху: *"Кожному стало зрозуміло, яку політику проводять німці щодо українського населення, – згадував після вигнання німців командир Золотоніського партизанського загону Михайло Савран. – Навіть та частина населення, яка в свій час була ображена радянською владою (розкуркулені та інші) зрозуміла, що принесли німці на Україну, як вони знущаються та будуть знущатися над українським населенням"*. За спогадами партизанського ватажка, перше розуміння необхідності боротьби проти нацистських окупантів у населення з'явилося після масових розстрілів місцевих євреїв у жовтні 1941 р. Подальші арешти та вбивства радянських активістів підштовхнули до

організації людей на боротьбу проти нацизму". Радянський режим мав намір виявити на окупованих нацистами територіях організації руху опору та підпорядкувати їх собі. Для цього через лінію фронту проводили перекидання організаційно-диверсійних груп. Окремим пунктом для таких загонів вказувалось: "При виявленні партизанських загонів чи груп, не керованих Штабом партизанського руху, негайно підпорядкувати їх собі зі сповіщенням про це Штабу партизанського руху". Після звільнення територій від нацистів, радянський режим проводив численні перевірки серед повстанців, учасників руху Опору. Дістати офіційне підтвердження учасника руху Опору так само було не простою задачею. За національним складом в русі Опору переважали українці – 59 %, росіян було 22 %, а білорусів 6,6 % [16].

Учасник Другої світової війни та битви за Сталінград Іван Залужний розповідає про побратимство в ті часи. Солдатів тоді гуртувала єдина мета – перемогти "фашистів", Гітлера. Навколо ідеї цієї перемоги будувалися побратимські відносини, мотивація захищати свою землю. Радянська армія була багатонаціональною. Іван зазначає, що попри це, всі нації були об'єднані в тому числі відчуттям помсти за полеглих побратимів: *"Ось автомат у мене в руках. Це загиблого білоруса. Я був офіцер – у мене був пістолет, а в нього автомат. Я взяв автомат і сказав, і написав, що я цим автоматом, друже мій Олексію, помщуся. І татарина є у мене в альбомі світлина. Він сфотографований. Володимир Абдуллін. Я про що оце кажу, що всі національності були єдині. Ми говоримо, українці хочуть миру, але для того, щоб був мир, потрібно бути сильними. Аби бути сильними, треба нам об'єднатися. Аби всі були, як один. А ті, хто у нас там різні сепаратисти, ті, що демонстрації розстрілювали – як їх називають..."*. Онук Івана, Іван Гутнік-Залужний, загинув в бою за Україну поблизу Амвросіївки 10 серпня 2014 р. Він був командиром запорізького взводу Національної гвардії України. Ветеран Другої світової війни не розуміє, як онуки його побратимів, з якими вони пліч-о-пліч стримували й билися із нацистами, могли піти війною на Україну: *"І я там казав, що, товариші росіяни, мої фронтовики, побратими, друзі мої, що ж ви робите? Ми разом воювали. Ми разом ділили кусень хліба на кількох людей. Ми одну цигарку курили на 20 чоловік. Ми разом в окопах були. А тепер ваші – своїх дідів сини – вбили мого онука, воюючи. Я не звинувачую рядових – це один робить диктатор. Це хто? Це Путін та його оточення вас послали. Звертайтеся, пишіть звернення всі. Та припиніть же все це. Кому ж ця війна потрібна? Війна нікому не потрібна – це ж горе, нещастя, сльози"*. Також ветеран зазначав, що не всі росіяни хочуть війни, а тільки ті, які підтримують путіна. Слід зазначити, що Іван Залужний підтримував відстоювання незалежності України зі зброєю в руках з початком російсько-української війни. Та все ж ми бачимо, як багаторічний міф про героїзм і братерство в Червоній армії часів Другої світової війни глибоко вкоренився в суспільстві [17].

Повертаючись з фронту, з війни "переможцями" часто побратими, особливо поранені, не мали відповідного ставлення з боку держави. Часто таким ветеранам доводилось жити у дуже скрутному становищі. Наприклад, інвалід фронтовик Меркотенко після демобілізації проживав у примітивній халупці на станції Знам'янка Одеської залізниці на місці спаленої нацистами рідної домівки:. Він вирішив поскаржитись секретарю ЦК КП(б)У Микиті Хрущову: *"Вибачте, що Вам пишу, а не до місцевої влади звертаюся. Справа в тому, що ні вимог, ні прохань, ні навіть благань вона не сприймає... Мені ще й дев'ятнадцяти немає, а довелося перебачити вже все: і гуркіт гармат, і голод, і холод, і нужду зі смертю. У 1943 році, не маючи й сімнадцяти років, я став воїном. Тепер моє тіло прикрашають шість ран, якими я пишаюся... З грудня 1944 року, коли з госпіталю я повернувся додому інвалідом, потягнулися довгі дні моєї нужди. Наш будинок зруйнований, а та халупка, яку ми побудували, і в ній живемо, "схиляє" до самогубства. Ходжу в старому одязі з госпіталю, обмундирування звідти ж. Звертаюся до знам'янського начальства вже протягом десяти місяців і завжди чую одне й те ж: "ні" або "якщо буде, то дамо". Оскільки допомоги не отримую, живу на 300 грамів хліба. Пішов у міськком КП(б)У, а там перший секретар Бразикевич сказав: "У нас нічого немає, можете не ходити..."*. Часто інваліди війни ставали жебраками, потім таких правоохоронні органи виловлювали, затримували й відправляли у так звані інтернати закритого типу, за своїм виглядом та умовами схожі на в'язницю, розташовані у віддалених районах Радянського Союзу [18].

Таким чином, в радянській армії часів Другої світової війни шляхом пропаганди поширювався міф про героїзм, мужність, братерство у боротьбі із "фашизмом". Ще вчорашній союзник Радянського Союзу – Гітлерівська Німеччина стала ворогом і об'єднуючим фактором для тогочасного радянського суспільства і вояків. За цими переможними історіями героїзму радянський режим ретельно приховував методи боротьби із дезертирством, полоненими радянськими військовими, "шпигунами". Найбільш популярними й поширеними методами були застосування зброї та відправка у концтабори у віддалені регіони Радянського Союзу. Після "великої перемоги" радянський режим також боровся з інвалідами війни, які значно "погіршували" імідж переможної армії: платили мізерні виплати, а тих, хто опинився у скрутному становищі на межі із жебрацтвом – вивозили в трудові табори, які більше нагадували в'язниці. Як бачимо, те "побратимство" між різними національностями – українцями, росіянами, білорусами та іншими, яке так оспівувалось радянською пропагандою, обернулося загарбницькою війною росії проти України в 2014 р.

В часи воєнної інтервенції Радянського Союзу в Афганістан, солдати, в тому числі українські, стали свідками загарбницької війни, відчули себе в ролі окупантів, це наклало "відбиток" на самих бійців. Солдати мали відчуття єдності під час бойових завдань та в побуті. Умови повсякденності були не

надто легкими через специфіку місцевості, де часто доводилось підійматися горами в будь-яку погоду. Втрата побратимів так само була болючою для солдата: *"Відразу мені здавалось, що як побачу убитого нашого солдата, то не видержу, але коли побачив це все на свої очі я подумав собі, а його також ждуть живим, а не мертвим і тоді "бере злість" на них, здається "вішав би як собак""* [19, с. 284]. Солдати часів інтервенції в Афганістан не надто розуміли причини вторгнення в чужу країну, і часто їх мотивацією битися з противником були саме побратими – поранені та вбиті. Інші учасники у своїх листах рідним так само вказують на мотивацію воювати тільки завдяки побратимству, наприклад, лейтенант Ю. Харитончик у листі дружині писав: *"Доводиться ризикувати своїм життям, щоб вберегти інших від небезпеки, яка на них очікує. А інші ризикують, щоб прикрити нашу роботу – роботу саперів, і це тут називають взаємодопомогою. Кожен повинен дивитися людям в очі без докорів сумління, і я не хочу, щоб потім на мене вказували, що я ховався за чиїмись спинами…"*. Його товариш, побратим, П. Варга писав: *"Пам'ятаю, як мерзли в горах на голому камінні, зігрівали один одного своїми тілами, все пам'ятаю – і смерті, і кулі, і сльози на очах. Так невже ми змогли ось так все забути? Я хочу зустрітися зі всіма, хочу підняти тост за тих, хто лишився там, адже вони теж хотіли жити…"* [19, с. 285-286]. Про відсутність мотивації воювати на чужій землі за чужу Батьківщину солдати писали наступне: *"Серед наших є втрати: вбиті, поранені, каліки – для війни це закономірний процес. Однак одна справа, коли за свою Батьківщину, а інша – коли за тих "сволочів". А кінця цієї бійні – не видно. Душмани вже стали обстрілювати місця нашої дислокації реактивними боєприпасами…"*; *"…Знаєш, Наталочко, як набриднув цей Афган, якби ти тільки знала… Скоріше б покінчити із цим жахіттям. Якщо тут ще пів року служби – то з розуму можна зійти. Але, все-таки, залишились дні, а не місяці і від цієї думки стає легше…"* [19, с. 285]. Таким чином, солдати у війні Радянського Союзу проти Афганістану, не були надто вмотивовані воювати на чужій землі, бути в ролі окупантів. Звичайно, радянська пропаганда та ідеологія багатьом підходила як пояснення і виправдання цієї війни та її жертв. З роками багато військових побачили на власні очі всі жахіття і страшні наслідки цієї інтервенції як для себе, так і для місцевого населення Афганістану. Чи не єдиною мотивацією продовжувати службу та не дезертирувати було саме побратимство. В бойових умовах, в побутовому фронті бійці, знаходячись далеко від дому, починали товаришувати, зближуватись, відчуття єднання, а потім відчуття втрати побратимів або їх поранення спричиняли злість на противника. Та все ж значення бойового побратимства починає в цей період втрачати свій первісний сенс, бійці не об'єднані однією ідеєю та спільною метою, вони мають лише бажанням вибратись чимскоріше живими та повернутися до своїх рідних на рідну землю у свою країну.

Після здобуття Україною незалежності у 1991 р. бойове побратимство проявлялось серед військовослужбовців, які проходили миротворчі місії в інших країнах. Сергій Затхей, гвардієць 19 Миколаївського полку охорони громадського порядку Південного оперативно-територіального об'єднання Національної гвардії України, ділиться своїм досвідом: *"Я починав свою службу у міліції, тоді мені запропонували взяти участь у миротворчій місії. Я прибув у Київ для проходження відбору, на одне місце було десять чоловік, але мені вдалось потрапити до складу підрозділу, який виїжджав у Косово"*. Він також наголошує на контакті із місцевим населенням, представників різних національностей, які переконували бійців у приналежності території, на які вони проходять службу. На цій місії Сергій втратив побратима: *"О 5 ранку ми зробили сумісну фотографію з хлопцями, а вже через кілька годин втратили одного з товаришів. Але ми не здавались, ніхто з наших хлопців не здався, ми стояли до кінця"*, – розповідає Сергій. Сергій і досі переглядає фотографії зі служби та згадує своїх побратимів, вони підтримують контакт. Сьогодні боєць застосовує свій досвід у місії на полі бою, захищаючи Україну у складі Нацгвардії [20].

Українські миротворці не стояли осторонь, коли мова йшла про загрозу мирному населенню. Різанина в Сребрениці стала шоком для сучасного цивілізованого світу, де серби вбили 8 тисяч боснійських мусульман. Це сталось, коли миротворці пішли з міста. Така сама доля чекала місто Жепа, яке захищав загін українців і складався із 79 бійців. Українці втримали місто, яке серби взяли в облогу і знищували мінометами. Стійкість українців схилила сербського генерала Младича до переговорів. Український командир загону Микола Верхогляд погодився на переговори: *"Мені одного разу Младич сказав: "Ти хороший солдат. З сильними людьми завжди домовляються. Слабким людям диктують умови""*, – Микола Верхогляд, командувач українських миротворців у місті Жепа. Тоді вдалось з допомогою французів евакуювати близько 5 тисяч людей. У 2021 р. генерал Верхогляд отримав звання Героя, посмертно [21]. Петро Грималюк, військовослужбовець Нацгвардії України, який у 2003–2004 роках працював у міліції, виконував завдання патрульного під час миротворчої місії у Косово. Він зазначає, що відбір був важкий, дев'ять людей претендувало на одне місце. Мотивацією було перевірити себе і допомогти іншій країні, адже хочеться, щоб у світі було менше насильства. Боєць згадує і про відносини між побратимами: *"Між нами була дуже дружня атмосфера, і ми підтримуємо зв'язок. Багато хлопців, які зі мною були, зараз – на передовій"*, – пригадує часи миротворчої місії Петро Грималюк [22].

Для українських бійців участь у миротворчих місіях стала нагодою покращити свої професійні навички та вивчити нові, застосувати їх на практиці. В таких місіях українці проявляли побратимство, відчували відповідальність один за одного. Щоб потрапити у миротворчу місію, часто потрібно було проявити свої найкращі вміння, показати себе

з найкращої сторони, пройти численні іспити. І хоча місії не мали такого масштабного характеру, як Перша світова, Друга світова, та все ж українським військовим доводилось переживати біль втрати своїх побратимів. Нові знання, навички, досвід стали у нагоді у 2014 р.

Висновки.

1. На війні формується особливий вид стосунків, споріднення між солдатами – бойове побратимство. Це важливий чинник в ході ведення війни, адже для успішного проведення бойових завдань в армії має бути злагодженість, взаєморозуміння, об'єднаність спільною ідеєю та метою. Побратимство формується на фронті та залишається в мирному житті, споріднює бійців на все життя. На війні воїни переживають унікальний, важкий досвід, який пересічній людині важко уявити, а тим більше зрозуміти. Саме тому важливо після проходження служби на фронті мати підтримку однодумців, які розуміють пройдений тобою тернистий шлях.

2. З часів Першої світової війни поняття побратимства по-різному проявлялось, та в усіх періодах є і спільні риси цього явища. Для всіх періодів характерним є відповідальність за свого побратима на полі бою. В умовах постійного страху, важких побутових умовах, на межі житті й смерті проявляються найяскравіші риси людини. У мирному житті рідко, коли можна побачити, що людина здатна під загрозою власної смерті врятувати іншого, натомість побратим врятує, зробить все необхідне, щоб доправити до більш безпечного місця, надасть необхідну допомогу. Про звичай побратимства під час Першої світової війни знаходимо відомості у спогадах вояків.

3. Для воїнів УПА найважчим на фронті були втрати побратимів. Загиблих вшановували мовчанкою або пам'ятною промовою. Якщо тіла побратимів не знаходили на полі бою одразу, тоді віддавали шану заочно, пізніше тіла знаходили та ховали. Керівництво завжди дбало про пам'ять полеглих бійців. Повстанці часто підтримували контакти зі своїми рідними, коханими та побратимами за допомогою листівок. Таким чином і піднімали бойовий дух. Українська повстанська армія стала взірцем національної свідомості, міцності бойового духу, а також побратимства для сучасних воїнів.

4. В радянській армії в часи Другої світової війни солдатів гуртувала єдина мета – перемогти "фашистів", Гітлера. Навколо ідеї цієї перемоги будувалися побратимські відносини, мотивація захищати свою землю. Радянська армія була багатонаціональною, але попри це, всі нації були об'єднані в тому числі відчуттям помсти за полеглих побратимів. Ветерани Другої світової війни сьогодні часто не розуміють, як онуки їх побратимів, з якими вони пліч-о-пліч стримували й билися із нацистами, могли піти війною на Україну у 2014 р. Побратимство яскраво проявлялось серед учасників партизанського руху. Повертаючись з фронту, з війни "переможцями" часто побратими, особливо поранені, не мали відповідного ставлення з боку радянської влади. Часто таким ветеранам доводилось жити у дуже скрутному становищі.

5. В часи воєнної інтервенції СРСР в Афганістан, солдати, в тому числі українські, стали свідками загарбницької війни, відчули себе в ролі окупантів, це наклало "відбиток" на самих бійців. Солдати єдналися під час бойових завдань та в побуті. Умови повсякденності були не надто легкими через специфіку місцевості. Втрата побратимів так само була болючою для солдатів. Солдати часів інтервенції в Афганістан не надто розуміли причини вторгнення в чужу країну, і часто їх мотивацією битися з противником були саме побратими – поранені та вбиті. У своїх листах рідним воїни так само вказують на мотивацію воювати тільки завдяки побратимству. Та все ж значення бойового побратимства починає в цей період втрачати свій первісний сенс, бійці не об'єднані однією ідеєю та спільною метою, вони мають лише бажанням вибратись чимскоріше живими та повернутися до своїх рідних на рідну землю у свою країну.

6. Для українських бійців участь у миротворчих місіях стала нагодою покращити свої професійні навички, вивчити нові та застосувати їх на практиці. В таких місіях українці проявляли побратимство, відчували відповідальність один за одного. Щоб потрапити у миротворчу місію, часто потрібно було проявити свої найкращі вміння, показати себе з найкращої сторони, пройти численні іспити. І хоча місії не мали такого масштабного характеру, як Перша світова, Друга світова, та все ж українським військовим доводилось переживати біль втрати своїх побратимів. Нові знання, навички, досвід стали у пригоді коли у 2014 р. розпочалася російсько-українська війна.

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JURIDICAL SCIENCES

CONCEPTS OF THE CRIMINAL LIABILITY FOR CORRUPTION OFFENSES IN THE LEGISLATION OF THE REPUBLIC OF KAZAKHSTAN

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Abstract

The conceptual approach to the formation of the legal foundations of criminal liability in the Republic of Kazakhstan has undergone significant changes over time. In particular, a number of periods can be distinguished:

- the period from the 1990s to 2007, when the Law of the Republic No. 267-1, aimed at combating corruption, was put into effect, in 2001 the anti-corruption program for 2001-2005 was adopted for the first time.

- the period from July 2007 to the 2015 reform is the period of the anti-corruption strategy 2011-2015, and the adoption of some amendments to the criminal legislation, that is, until the period when more significant changes were made to the criminal legislation of the Republic in 2015.

- the period from 2015 to the current stage of development of legislation.

Keywords: criminal liability, corruption offences, anti-corruption legislation, Criminal Code.

1. At the first stage conditionally allocated by us, the legal approach in the regulation of criminal liability for corruption crimes was at the stage of its archaic development. In the legal structure of criminal legislation, only the first prerequisites were laid for the detailed regulation of criminal liability in this matter, state authorities are making only the first attempts to develop the concept of criminal liability for corruption in the activities of officials. The already mentioned Anti-corruption Law was adopted in 1998, which was a more or less detailed document regulating anti-corruption. By a President decree of 2001, this law was supplemented by the State anti-corruption program for 2001-2005 with an action plan, one of the goals of which was to improve the legal framework for combating corruption.

The Criminal Code of the Republic of Kazakhstan as of 2005 contained a fairly limited set of criminalized acts related to corruption. Criminal liability was provided for economic crimes, which, according to the legislator, may also be related to corruption, in particular, among them, the Criminal Code contained embezzlement of entrusted property (Article 176 of the Criminal Code), money laundering obtained by criminal means (Article 193 of the Criminal Code), economic smuggling (Article 209 of the Criminal Code). And a separate section provides for crimes that had a purely corrupt orientation as the main motive, in particular, they included abuse of official authority (Article 307 of the Criminal Code), abuse of power (Article 308 of the Criminal Code), mediation in bribery (Article 310 of the Criminal Code), forgery of official documents (Article 314 of the Criminal Code), non-fulfillment official powers (Article 315 of the Criminal Code), abuse of official powers (Article 380 of the Criminal Code).

Meanwhile, despite all the measures taken in terms of legislative regulation of the criminal law approach to the application of responsibility for corruption, a number of significant gaps and shortcomings in legal regulation, both at the organizational and substantive levels, are visible in the legislation of the period from 1990 to the 2000s:

- the details of the elements of crimes and criminal responsibility for the commission of acts of corruption are at this stage rather limited and fragmented, the proposed definitions of most corruption acts and, accordingly, criminal liability for their commission, significantly narrow the scope of influence on corrupt officials compared to the approach and standards proposed in the leading documents of the United Nations and the European Union, already existing at that time period;

- the elements of crimes in the Criminal Code of the Republic of Kazakhstan in the specified period are formulated insufficiently fully and expanded, for example, in the article on bribery, the subject of a bribe is reduced only to obtaining material benefits, and does not apply to obtaining non-monetary, non-material benefits and advantages;

- criminal liability for the promise of a bribe, extortion of a bribe is not provided for in certain compositions, and the commission of these actions is covered only within the framework of an attempt to commit a crime;

- there is no criminal liability for the commission of a crime in the form of bribery in favor of a third party;

- the system of punishments in the Criminal Code is inconsistent, on the one hand it is ranked and distributed depending on the severity of the crimes committed, and punishments reach up to 12 years in prison with forced confiscation of property for forms of passive bribery, but, on the other hand, sanctions for active bribery are represented only by the imposition of a fine and terms of imprisonment from three to five years of imprisonment, which hardly indicates their preventive and preventive properties;

- the statute of limitations for bringing to criminal responsibility for the commission of the most common forms of active bribery does not exceed two years, which is clearly disproportionate to the purposes and functions of the application of criminal responsibility, since crimes are very latent;

- the definitions of subjects given in the criminal legislation and in the legislative acts in force at that

time, which are subject to criminal liability and criminal prosecution, are sufficiently vague and require clarification of many features;

- the application of a number of measures of criminal legal impact, such as confiscation of property as an additional punishment, is weakly expressed and occurs at the discretion of the law enforcement officer and is only a mandatory measure in some cases;

- the criminal legislation of Kazakhstan does not involve bringing legal entities to criminal responsibility, unlike in European countries;

- the application of criminal liability is possible for the commission of active and passive forms of bribery in accordance with Articles 311-313 of the Criminal Code, but Article 313 provides for liability only for receiving a bribe in favor of the bribe-taker for committing actions in the interests of the bribe-taker or other persons represented by him, as well as for providing patronage or connivance in the commission of his actions, it also says about giving a bribe, and mediation in bribery, but it does not provide for criminal prosecution for extortion of a bribe and giving its promise or offering a bribe;

- inconsistently, the description of the bribe itself is given as a basis for criminal liability, so in Article 311 of the Criminal Code, the signs of a bribe characterize it as a form of "money, securities, other property, property rights, or material benefits", and Article 312 does not contain such characteristics, and simply mentions a bribe, the Criminal Code does not contain any other definitions of a bribe. Thus, criminal prosecution is possible only when committing acts of a corrupt nature that are associated with obtaining benefits of a property nature, and intangible assets or benefits are not covered by the concept of criminally punishable acts, which in general lags far behind international standards of criminal prosecution for bribery.;

- in the very law against corruption No. 267-1 of 02.07.1998. it contained article 13, listing acts that relate to obtaining benefits or advantages, that is, any remuneration in the form of money, services, in any form from any person; receiving gifts or services in connection with the performance of public functions, receiving invitations to travel for various purposes, and receiving other illegal benefits when obtaining loans, buying securities, property. But at the same time, this extensive system of bribes is not used as a basis for qualifying acts and bringing to criminal responsibility;

- Articles 311 and 312 of the Criminal Code of the period under study do not imply criminal prosecution for a bribe committed (transferred) in favor of third parties, only responsibility for receiving and giving a bribe in favor of persons equated in status to officials is provided, which in itself narrows the range of potentially punishable acts;

- the formal expression of criminal responsibility in the application of sanctions and punishments provided for in Articles 311 and 312 of the Criminal Code of the Republic of the period of the 2000s is an insufficiently balanced system. In particular, the inconsistencies and imbalance of criminal sanctions are expressed in the fact that for passive corruption activities (passive bribery), higher maximum penalties were provided, in particular from 5 to 12 years in prison, and for active bribery – from 3 to 5 years in prison. Thus, such an obvious disproportionate differentiation of criminal responsibility could not serve the purposes of an effective and preventive impact on corruption manifestations;

- insufficient attention is paid to the collection and analysis of various analytical data and research on a transparent and transparent methodology based on international experience, which will allow more objectively to get an idea of the areas of corruption, its scale and impact on specific institutions of society and management, which in turn will optimize criminal liability measures for corruption;

- The legal system of Kazakhstan has not accepted the provisions of the leading conventions regarding criminal liability for corruption crimes, such as the UN Convention against Corruption of 2003, the Council of Europe Convention against Corruption of 1999.

2. At the second stage of the development of anti-corruption legislation in the republic, the programs of the strategic development plan of the republic were traditionally adopted, the UN Convention against Corruption of 2003 was ratified and legislative measures were taken to adapt and implement its provisions in Kazakhstan's anti-corruption legislation, the anti-corruption strategy for 2011-2015 was approved on 31.03.2011, and also adopted in the first reading amendments to the criminal law regarding the regulation of liability of legal entities for corruption offenses. There have been more noticeable changes in the concept of criminal liability for corruption crimes after amendments to the criminal law were made by the laws of 21.07.2007 and 07.12.2009, these amendments are aimed at implementing the provisions of the Istanbul Action Plan and recommendations. In particular, the following legislative measures were implemented:

- criminal liability was introduced for receiving a bribe by any official in favor of, or as a benefit addressed to third parties, and a certain inconsistency between the provisions of criminal and administrative legislation was eliminated.

- the application of criminal liability for corruption crimes has been expanded by including among its subjects persons who perform managerial functions in organizations with state participation with a share of at least 35% and the relevant provisions have been extended to national holding companies and other similar persons;

- the list of corruption crimes has been expanded, for which an additional penalty is applied in the form of confiscation of property;

- in addition, the law on countering the laundering (legalization) of criminally obtained funds and the financing of terrorism was put into effect;

- The Government of the Republic of Kazakhstan submitted to the Parliament a bill on the introduction of criminal liability of legal entities for corruption crimes, and it was approved in the first reading of the lower house of Parliament;

- the list of corruption crimes referred to in paragraph 5. of the Notes to Article 307 of the Criminal Code of the Republic of Kazakhstan has been expanded

due to new compositions: the creation and/or management of a financial pyramid by a person authorized to perform state functions, or another person with a similar status, or related to the use of such a person of their powers; illegal acquisition of property by a person with official powers, performing the functions of state power, or a person with a similar status, or related to the use of his official powers by a person, as well as abuse of authority or improper exercise of authority, as well as inaction committed by officials from the military;

- sanctions were changed for some of the corruption crimes, the approach to their application was changed, in particular, such punishment as a fine, which was previously calculated as an amount equal to the total amount of wages received or other income of the accused person for a certain period of time, were excluded from criminal legislation;

- a number of general provisions of the criminal law on confiscation were supplemented with norms that extended confiscation also to the means and instruments of committing a crime;

- a provision was introduced prohibiting the use of imprisonment for crimes in the form of money laundering, obtained by criminal means, if the person who committed the crime voluntarily and fully reimburses all property damage caused to a citizen, organization or state, but with the exception of cases when it was committed by a person with authority, performing state functions, or by another person equated to him in status and is connected with the use of his official powers by such a person;

- the number of crimes for which there are no statute of limitations for criminal prosecution has been expanded, but at the same time corruption crimes have not been attributed to them, but only crimes against the order of management;

- Article 231 of the Criminal Code of the Republic of Kazakhstan was clarified and amended, in particular, criminal liability was introduced for general assistance (patronage) and indulgence in office or official duties in return for providing illegal monetary remuneration or other assets, the composition of commercial bribery (bribery) on a large scale and especially large scale was also introduced.

Nevertheless, even at this stage, there have not been sufficiently serious changes in the scope of criminal liability, which is reflected in the absence of real effective measures aimed at bringing legislation and practice of its application in line with international standards.:

- criminal liability has not been introduced for the offer or promise of a bribe, as well as for accepting an offer or promise to give a bribe;

- there is no criminal liability for extortion of a bribe as a completed crime, and not as an attempt at a bribe, both in the public and private sectors of management;

- the concept of responsibility for bribery, including in the commercial sphere of management, in favor of third parties has not been formed;

- there is no formal approach to criminalizing influence trading;

- in criminal legislation, the concept of a bribe is not given at all, including its content is not disclosed from the position that a bribe includes the transfer of benefits and advantages not only of a material, but also of an immaterial nature;

- the concepts of foreign officials, bribery in favor of foreign officials, and persons exercising public functions in international organizations have not been introduced;

- the crime of laundering criminal proceeds, including through corruption, has not been introduced into the criminal law in the form in which it should be in accordance with international norms and standards;

- there are no standards for bringing to criminal responsibility for illegally enriching officials who do not have their own transparent sources, which the UN Convention focuses on;

- the law has formed a clear and comprehensive concept of criminal liability of corporate legal entities, which would provide for a set of balanced and effective sanctions in terms of preventing and countering corruption committed using the method of corporate intervention and mediation. The specified specific criminal sanctions should take into account the nature of the person's activity and its sphere of influence of a corporate legal entity, the consequences of committing a crime and be proportionate to the nature of the act being committed, have a wide preventive preventive resonance. At the same time, the mechanism of criminal liability should be applied in the case of a crime committed by a person who has a certain position in the corporate management structure of a legal entity or there should be a lack of proper control by corporate officials;

- the provisions on active repentance in criminal legislation have not been fully evaluated in terms of their effect and impact on criminal liability in the commission of corruption crimes, and provisions have not been introduced that would exclude on this basis the evasion of criminal responsibility by persons in the commission of a number of crimes.

3. In 2014 Kazakhstan has adopted a new Criminal Code of the Republic, which entered into force on January 01, 2015 and since its adoption, we have been analyzing modern criminal anti-corruption legislation, which provided for a fairly wide range of innovations in the application of criminal liability for corruption, in particular:

- the chapter containing the components of corruption crimes is set out in a new edition, the composition of corruption crimes has been revised,

- definitions related to the grouping of corruption crimes were now concentrated in Article 3 of the Criminal Code of the Republic of Kazakhstan, which brought some greater clarity to the legislator's understanding of their composition;

- the terminology was supplemented with new definitions of "organization and management functions", commercial and administrative functions", which were not previously defined at the legislative level, but were only interpreted within the framework of Supreme Court rulings;

- the definition of "a person holding a position in the system of power" was expanded, in particular, the

term "a person holding a civil position" was introduced instead of the previously existing "public official in a state agency"; in previous versions of the Criminal Code, these definitions were not disclosed and were subject to interpretation by judicial authorities;

- the list of persons holding important public office has been expanded; in particular, it includes members of Parliament and judges;

- the definition of "persons authorized to perform public functions" has been changed, indicating that they include persons who are civil servants according to civil service legislation;

- employees of the National Bank of the Republic of Kazakhstan and its agencies are additionally included in the number of persons who have a status similar to that of persons endowed with public functions;

- in addition, a number of changes were introduced in the approach to sanctions for corruption crimes;

- in the Criminal Code of the Republic of Kazakhstan in 2015, it was prohibited, in the case of criminal prosecution for corruption offenses, the application of provisions on conditional release, on exemption from criminal liability in the case of reconciliation with the victim, exemption from criminal liability in connection with the use of bail or in connection with the expiration of the statute of limitations for criminal liability.

A comparative analysis of the approach of the Republic of Kazakhstan to the formation of the foundations for the application of criminal liability for corruption actions with similar approaches applicable in international standards, in the norms of European states and the European Union as a whole allows us to identify the main differences, which to a greater extent indicate the need for further clarification and improvement of the legal concept of Kazakhstan. In order to get an idea, we will conduct a general analysis of the approach to the application of criminal liability for acts of corruption that has been formed in modern pan-European legislative doctrine and practice, based, among other things, on the experience of applying international standards established by the UN and the OECD.

1. International standards and the pan-European approach developed on their basis proceed from the fact that corruption manifestations should receive an adequate response and response measures in the form of the application, first of all, of criminal sanctions. Only the criminal law regulation of Russia will ensure an appropriate level of anti-corruption, both at the level of prevention and at the level of post-criminal response. This is due to the nature and degree of danger and seriousness of corruption acts, and their extremely negative impact on management processes and the state of the economy in the state and society. The criminal law approach provides the most adequate and effective measures in detecting, investigating and prosecuting corruption and those involved in it. But nevertheless, in Kazakhstan, along with the criminal-legal way of responding, there is also a system of administrative measures to respond to corruption. Right-wing systems that provide, among other things, such a way of responding, that is, through the application of administrative and legal sanctions, are generally recognized as sufficiently ineffective. Even if they are coupled or combined with the application of criminal law prohibitions and measures, administrative and legal methods of influencing similar acts cannot constitute an adequate impact. Often they may compete or overlap with each other, administrative measures may give a false signal about the possibility of their application to acts that deserve more acute and harsh response measures, or their use may occur, including abuse by the officials themselves who use them, creating grounds for impunity for corrupt officials. That is, a vicious circle arises, among other things, when some persons commit acts of corruption, while others contribute to this to some extent. Thus, Kazakhstan is an example of a legal system in which, along with criminal liability, administrative liability can also be applied, which in general was also widely criticized in the Istanbul Action Plan applicable to Central Asian States, specially developed by the OECD during the monitoring of anti-corruption legislation of these countries. Based on the analysis carried out by the OECD during the monitoring of the development of Kazakh legislation, it is noted that in the legal system of Kazakhstan, no attempts have been made to eliminate all intersections, overlaps and inconsistencies, possible means for imposing criminal and administrative legal means of influencing corruption forms of manifestation.

2. The formation of criminal liability according to the idea of the creators of the UN Convention and European legislators for corruption crimes excludes the use of any double standards or standards related to the threshold establishment of criteria for classifying the same act as a crime or other acts of corruption, for example, acts prosecuted administratively. Although, in general, this issue is formulated abstractly and is at the discretion of the national legislator, but with a slightly different general wording given in the UN Convention and the CE Convention on Criminal Liability for Acts of Corruption. Thus, according to paragraph 1. of Article 30 of the UN Convention, each State party to the Convention undertakes obligations to introduce corruption offenses and establish responsibility for them in the form of sanctions commensurate with the seriousness and gravity of the crime. According to Articles 2 and 3 of the 1999 CE Convention, each party to the Convention must take appropriate legislative and other measures necessary to establish criminal liability, according to domestic legislation, for intentionally committing any actions related to active or passive corruption. That is, in the case of the CE Convention, we are talking about criminal liability, the same applies to the acts listed in articles 4-13 of the 1999 CE Convention. And only article 14 of the Convention refers to the establishment of criminal or other sanctions for the relevant acts. Thus, the European approach proceeds from the need to establish criminal liability for most of the corruption acts listed in the relevant Convention.

In Kazakhstan's practice and legal system today, there is still an approach that presupposes the establishment of two legal types of acts and the corresponding criminal and administrative responsibility, but separated by a certain threshold value, the boundary at which the act can become criminally punishable, pro-

vided that the amount of the alleged illegal benefit exceeds a certain threshold. The purpose of using such a system is an attempt to exclude the legal basis for bringing to criminal responsibility for less dangerous offenses, separated by a threshold criterion related to the amount of remuneration. But nevertheless, this approach does not meet the global standard that requires the application of criminal liability for any act in the field of corruption, regardless of the size of the illegal benefits received. The European and international approach presupposes the possibility of establishing different types of responsibility for various types of corruption acts, but not depending on the amount of remuneration received, respectively, it is assumed that in the Republic of Kazakhstan it is legitimate to consider not the application of the concept of the minimum threshold size of a criminal act, but the concept of a formal approach to its design features, which, if they are in combination, otherwise the situation develops, in which, outwardly, according to formal signs, the act manifesting itself as a crime can be qualified as an administrative offense as insignificant in its consequences. Nevertheless, Kazakhstan has retained in the Code of Administrative Offences after the 2014 reform the compositions of corrupt administrative acts that compete with the compositions of criminally punishable corruption. The Code of Administrative Offenses retains chapter 34, which is called "Administrative corruption offenses", among which there are compositions that can be transferred to the plane of criminally punishable.

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MATHEMATICAL SCIENCES

OPTIMALITY TYPE CONDITION OF THE PONTRHGIN MAXSIMUM PRINSIPLE IN THE PROBLEM OF CONTROL OF LINEAR FRACTIONALORDER DIFFERENCE EQUATIONS

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Abstract
The problem of optimal control of systems of linear two- dimensional difference equations of fractional order is considered. A number of optimality conditions are established.

Keywords: admissible control, optimal control, open set, fractional order difference equation, fractional operator, linearized maximum principle, fractionalsum, necessary and sufficient condition.

1. Introduction

Fractional calculus plays an important role in many areas of science and technology. It is known that (see, for example, [1]) the fractional integro-differential calculus originates from a discussion in correspondence between G. Lopital and G. Leibniz about the meaning of the derivative of order 1/2. But the idea of using a fractional difference appeared relatively recently (see, for example, [2-5]).

Fractional calculus also finds application in optimal control problemsdescribed by difference equations of fractional order [6-8].

Based on theoretical and practical applications, the development of a qualitative theory of optimal control problems described by various fractional-order difference equations is also relevant. Note that the theory of necessary optimality conditions for optimal control problems described by different fractional-order difference equations has been very little developed.

In [9], a representation of the solution of a boundary value problem for a system of linear nonhomogeneous two-dimensional fractional order difference equations is obtained.

In this paper, for the considered equation, the problem of optimal control underthe assumption that the control function enters the boundary condition, and thefunctional is linear is studied.

A necessary and sufficient optimality condition in the form of a discrete maximum principle is proved.

In the case of a non-linear but convex performance functional, a sufficient optimality condition is proved.

2. Statement of the problem.

Consider the problem of minimizing the linear functional

$$S(u) = c'a(x_1) + d'z(t_1, x_1) \tag{1}$$

under restrictions

$$u(x) \in U \subset R^r, x \in X, \{x_0, x_0 + 1, \dots, x_1 - 1\}.$$

$$\Delta^\alpha z(t + 1, x + 1) = \tag{2}$$

$$= A(t, x)z(t, x) + B(t, x)z(t + 1, x) + C(t, x)z(t, x + 1) + D(t, x), \tag{3}$$

$$z(t_0, x) = a(x), x \in X \cup x_1, \tag{4}$$

$$z(t, x_0) = b(t), \qquad t \in T \cup t_1, T = \{t_0, t_0 + 1, \dots, t_1 - 1\} \tag{5}$$

$$a(x_0) = b(t_0) = a_0,$$

$$\Delta^\beta a(x + 1) =$$

$$= K(x)a(x) + g(x, u(x)),$$

$$x \in X,$$

$$a(x_0) = a_0, \tag{6}$$

Here $A(t, x), B(t, x), C(t, x), K(x)$ are given $(n \times n)$- discrete matrix functions, $D(t, x)$- given n- dimensional discrete vector function, $b(t)$ given discrete vector function, a_0, t_0, t_1, x_0, x_1 are givens, $g(x, u)$-given continuous by u for all x

$n -$ dimensional vector function, $u(x) - r$ −dimensional vector function of control actions with values from a given non−empty and bounded set U (admissible control), и d - given n −dimensional constant vectors, and $\Delta^\alpha z(t, x)$, и $\Delta^\beta a(x)$, $0 < \alpha, \beta \leq 1$ fractional order operator by orders α and β (see for example, [2-5].

An admissible control that delivers the minimum value to the functional (1)under constraints (2)-(6) is called optimal controls.

3. The formula for the increment of the quality functional.

Let (x), $\bar{u}(x) = u(x) + \Delta u(x)$ − two admissible controls. Through $((x),$

$z(t, x)), (\bar{a}(x) = a(x) + \Delta a(x), \bar{z}(t, x) = z(t, x) + \Delta z(t, x))$ denotes the solutions of system (2)–(6) corresponding to them. Then the increment of functional (1) takes the form

$$\Delta S(u) = c'\Delta a(x_1) + d'\Delta z(t_1, x_1). \tag{7}$$

Here $\Delta(x)$, $\Delta z(t, x)$ are solutions to problems

$$\Delta^\beta \Delta a(x) = K(x)\Delta a(x) + \Delta_{\bar{u}(x)} g[x], \tag{8}$$

$$\Delta a(x_0) = 0. \tag{9}$$

$$\Delta^\alpha \Delta z(t + 1, x + 1) = A(t, x)\Delta z(t, x) +$$
$$+B(t, x)\Delta z(t + 1, x) + C(t, x)\Delta z(t, x + 1), \tag{10}$$

$$\Delta z(t_0, x) = \Delta a(x), x \in X \cup x_1, \tag{11}$$

$$\Delta z(t, x_0) = 0, t \in T \cup t_1, \tag{12}$$

respectively.

Here, according to definition,

$$\Delta_{\bar{u}(x)} g[x] = g(x, \bar{u}(x)) - g(x, u(x))$$

As can be seen, equations (8) and (10) are systems of linear nonhomogeneousdifference equations with respect to $\Delta(x)$ и $\Delta z(t, x)$ correspondingly.

Takes place [2]

Theorem 1. Solution y(t) systems of linear nonhomogeneous differenceequations of fractional order

$$\Delta^\alpha y(t + 1) = A(t)y(t) + g(t)$$

with initial conditions

$$y(t) = y_0.$$

admits representation

$$y(t) = y_0 \prod_{j=t_0}^{t-1} [+R_\alpha(t - 1, j)A(j)] +$$

$$+ \sum_{j=t_0}^{t-1} R_\alpha(t - 1, j)f(j) \prod_{k=j+1}^{t-1} [1 + R_\alpha(t - 1, k)A(k)] \tag{13}$$

where

$$R_\alpha(t, j) = \binom{t - j + \alpha - 1}{t - j}.$$

A binomial coefficient $\binom{a}{n}$ is determined by the formula

$$\binom{a}{n} =$$

$$= \begin{cases} \dfrac{\Gamma(a+1)}{\Gamma(a-n+1)\Gamma(n+1)}, & n > 0, \\ 1, & n = 0, \\ 0, & n < 0. \end{cases}$$

Here for any $x, y \in R$, $\quad x^{(y)} = \dfrac{\Gamma(x+1)}{\Gamma(x+1-y)}$, where Γ – the gamma function for which holds the identity $\Gamma(x+1) = x\Gamma(x)$.

By Theorem 1, the solution of equation (8) with initial conditions (9) isrepresented as

$$\Delta a(x) = \sum_{j=x_0}^{x-1} R_\beta(x-1,j)\Delta_{\overline{u}(j)}g[j] \times$$

$$\times \prod_{m=j+1}^{x-1} \left[1 + R_\beta(x-1,m)K(m) \right].$$

Introduce the following notation

$$\Phi(x,j) = R_\beta(x-1,j) \prod_{m=j+1}^{x-1} \left[1 + R_\beta(x-1,m)\ K(m)\quad \right],$$

(15)

then

$$\Delta a(x) = \sum_{j=x_0}^{x-1} \Phi(x,j)\Delta_{\overline{u}(j)}g[j]$$

(16)

It follows from the result of [9] follows

Теорема 2. Solution $z(t, x)$ of the boundary value problem (3)-(5) for a system of linear 2D fractional order difference equations can be represented in the following form

$$z(t,x) = a(x_0) + \sum_{j=t_0}^{t-1} R_\alpha(t-1, x-1; j, x_0-1)$$

$$\times C(j, x_0-1)b(j) + \sum_{s=x_0}^{x-1} R_\alpha(t_0-1, x-1; t_0-1, s)\,B(t_0-1,s)a(s) +$$

$$+ \sum_{j=t_0}^{t-1}\sum_{s=x_0}^{x-1} R_\alpha(t-1, j; s)\,D(j,s)\,.$$

(17)

Here

$$R_\alpha(t-1, x-1; j, s) =$$

$$= \binom{t-j+\alpha-1}{t-j}\binom{x-s+\alpha-1}{x-s},$$

where $R_\alpha(t-1, x-1\,; j\,, s)$ is solution to the following problem:

$$R_\alpha(t-1, x-1; j, s)A(j, s) = -R_\alpha(t-1, x-1; j-1, s)B(j-1, s) -$$

$$-R_\alpha(t-1, x-1; j, s-1)C(j, s-1), \quad j = t-1, \ldots, t_0, s = x-1, \ldots, x_0,$$

(18)

$$R_\alpha(t, x; t-1, x-1) = E.$$

Then it is clear that,

$$\Delta z(t, x) = \sum_{s=x_0}^{x-1} R_\alpha(t-1, x-1; t_0-1, s) \, B(t_0-1, s)\Delta a(s).$$

(19)

Substituting (16) into (19) we will get:

$$\Delta z(t, x) = \sum_{s=x_0}^{x-1} R_\alpha(t-1, x-1; t_0-1, s) \, B(t_0-1, s)\Delta a(s)$$

$$= \sum_{s=x_0}^{x-1} R_\alpha(t-1, x-1; t_0-1, s) \, B(t_0-1, s) \sum_{j=x_0}^{x-1} \Phi(x, j)\Delta_{\bar{u}(j)} g[j].$$

Assuming

$$Q_1(t, x, s) = \sum_{\tau=s+1}^{x-1} R_\alpha(t-1, x-1; t_0-1, \tau)B(t_0-1, \tau)\Phi(\tau, s)$$

(20)

we get that

$$\Delta z(t, x) = \sum_{s=x_0}^{x-1} Q_1(t, x, s)\Delta_{\bar{u}(s)} g[s].$$

(21)

Taking into account relations (16) and (21), the increment formula (7) can be written as

$$\Delta S(u) = c'\Delta a(x_1) + d'\Delta z(t_1, x_1) =$$

$$= \sum_{x=x_0}^{x_1-1} c'\Phi(x_1, x)\Delta_{\bar{u}(x)} g[x] + \sum_{x=x_0}^{x_1-1} d'Q_1(t_1, x_1, x)\Delta_{\bar{u}(x)} g[x] =$$

$$= \sum_{x=x_0}^{x_1-1} [c'\Phi(x_1, x) + d'Q_1(t_1, x_1, x)]\Delta_{\bar{u}(x)} g[x].$$

(22)

Assuming

$$p(x) = -\,[c'\Phi(x_1, x) + d'Q_1(t_1, x_1, x)\,]$$

$$M'(x, u, p) = p'g(x, u)$$

$$\Delta_{\bar{u}(x)} M[x] = p'^{\Delta_{\bar{u}(x)}} g[x],$$

(23)

relation (22) is written as

$$\Delta S(u) = -\sum_{x=x_0}^{x_1-1} \Delta_{\bar{u}(x)} M[x].$$

(24)

It can be proved that the vector function (x) defined by formula (23) is a solution of equation

$$p(x-1) = -[c'\Phi(x_1, x-1) + d'Q_1(t_1, x_1, x-1)].$$

(25)

Next, from (19) we obtain that

$$Q_1(t_1, x_1, x - 1) =$$

$$= R_\alpha(t_1 - 1, x_1 - 1; t_0 - 1, x)Q_1(t_1, x_1, x). \tag{26}$$

Taking into account (15), (26) in (25) we have

$$p(x - 1) = p(x) + \psi(t_0 - 1, x)B'(t_0 - 1, x), \tag{27}$$

where by definition

$$\psi(t, x) = -R'_\alpha(t_1, x_1; t, x)d.$$

From (25) follows that

$$p(x_1 - 1) = -c. \tag{28}$$

Further, using (28) it is shown that $\psi(t, x)$, defined by the formula

$$\psi(t, x) = -R'_\alpha(t_1 - 1, x_1 - 1; t, x)d,$$

is a solution to the boundary value problem

$$\psi(t - 1, x - 1) = A'(t, x)\psi(t, x) +$$

$$-B'(t, x)\psi(t - 1, x) - C'(t, x)\psi(t, x - 1),$$

$$\psi(t_1 - 1, x - 1) = B'(t_1 - 1, x)\psi(t_1 - 1, x),$$

$$\psi(t - 1, x_1 - 1) = C'(t, x_1 - 1)\psi(t, x_1 - 1),$$

$$\psi(t_1 - 1, x_1 - 1) = -d. \tag{29}$$

4. Condition of optimality.

With the help of representation (24) it is proved

Theorem 3. For the optimality of an admissible control $(x), x \in X$ in theproblem (1)-(5) necessary and sufficient that the equality

$$\max_{v \in U} M(\xi, v, p(\xi)) = M(\xi, u(\xi), p(\xi)), \tag{30}$$

is satisfied for everyone $£ \in X$.

Proof. Necessity: Suppose, that (x) optimal control. Then it follows fromthe increment formula (24) that for any admissible control $\bar{u}(x) = u(x) + \Delta u(x)$

$$\sum_{x=x_0}^{x_1-1} \Delta_{\bar{u}(x)} M[x] \le 0. \tag{31}$$

Using arbitrariness $\bar{u}(x)$, define it as follows

$$\bar{u}(x) = \begin{cases} v, & x = \xi \in X, \\ u(x), & x \ne \xi \in X, \end{cases}$$

where $£ \in X$ arbitrary point, $v \in U$ arbitrary vector.

Then inequality (31) takes the form:

$$\Delta_v M[\xi] \le 0.$$

Hence, due to the arbitrariness $v \in U$ and $£ \in X$ follows the maximum condition(30).

Let us proceed to the proof of the sufficiency of the maximum condition (30).

Suppose that for an admissible control (x) the Pontryagin maximumcondition (30) is satisfied. It follows from this, that for any $£ \in X$, $\bar{u}(£) = v \in U$,

$$\Delta_{\bar{u}(\xi)} M[\xi] \le 0.$$

Hence, due to the arbitrariness $£ \in X$ follows, that

$$\sum_{\xi=x_0}^{x_1-1} \Delta_{\bar{u}(\xi)} M[\xi] \le 0.$$

Taking into account this inequality, from (24) we obtain that for anyadmissible control $\bar{u}(x)$

$$\Delta S(u) = S(\bar{u}) - S(u) \geq 0, \quad \text{т.е.}$$

$$S(\bar{u}) \geq S(u).$$

It follows from the last relation that the control (x) is the optimal control.

This proves the sufficiency of the discrete condition for the Pontryagin maximum.

5. The case of a convex performance criterion.

Let's study more general case. Consider the problem of minimizing the functional

$$S(u) = \varphi_1\big(a(x_1)\big) + \varphi_2\big(z(t_1, x_1)\big), \tag{32}$$

under restrictions (2)-(5).

Here $\varphi_1(a)$, $\varphi_2(z)$ − are given continuously differentiable and convex scalar functions.

In the case of problem (1)-(5), (32), the increment of functional (32) corresponding to admissible controls (x), $\bar{u}(x) = u(x) + \Delta u(x)$ using the Taylor formula can be written as

$$\Delta S(u) = S(\bar{u}) - S(u) = \frac{\partial \varphi'_1\big(a(x_1)\big)}{\partial a}\Delta a(x_1) +$$

$$+\frac{\partial \varphi'_2\big(z(t_1,x_1)\big)}{\partial z}\Delta z(t_1, x_1) + o_1(\|\Delta a(x_1)\|) + o_2(\|z(t_1, x_1)\|), \tag{33}$$

where the quantities $o_i(\cdot), i = 1,2$ are determined from expansions

$$\varphi_1\big(\bar{a}(x_1)\big) - \varphi_1\big(a(x_1)\big) = \frac{\partial \varphi_1\big(a(x_1)\big)}{\partial a}\Delta a(x_1) + o_1(\|\Delta a(x_1)\|),$$

$$\varphi_2\big(\bar{z}(t_1, x_1)\big) - \varphi_2\big(z(t_1, x_1)\big) = \frac{\partial \varphi_2\big(z(t_1, x_1)\big)}{\partial z}\Delta z(t_1, x_1) + o_2(\|z(t_1, x_1)\|).$$

Using representations (16), (21), the increment formula (33) is transformed to the form:

$$\Delta S(u) =$$

$$= \sum_{x=x_0}^{x_1-1} \frac{\partial \varphi_1\big(a(x_1)\big)}{\partial a}\Phi(x, x_1)\Delta_{\bar{u}(x)}g[x] + \sum_{x=x_0}^{x_1-1} \frac{\partial \varphi_2\big(z(t_1, x_1)\big)}{\partial z}Q_1(t_1, x_1, x) \times$$

$$\times \Delta_{\bar{u}(x)}g[x] + o_1(\|\Delta a(x_1)\|) + o_2(\|z(t_1, x_1)\|) =$$

$$= \sum_{x=x_0}^{x_1-1} \left[\frac{\partial \varphi_1\big(a(x_1)\big)}{\partial a}\Phi(x, x_1) +\right.$$

$$\left.+\frac{\partial \varphi_2\big(z(t_1, x_1)\big)}{\partial z}Q_1(t_1, x_1, x)\right]\Delta_{\bar{u}(x)}g[x] +$$

$$+o_1(\|\Delta a(x_1)\|) + o_2(\|z(t_1, x_1)\|). \tag{34}$$

Assuming

$$p'(x) = -\left[\frac{\partial \varphi_1\big(a(x_1)\big)}{\partial a}\Phi(x, x_1) + \frac{\partial \varphi_2\big(z(t_1, x_1)\big)}{\partial z}Q_1(t_1, x_1, x)\right],$$

$$M(x, u, p) = p'g(x, u), \tag{35}$$

$$\psi(t, x) = -R'_\alpha(t_1, x_1; t, x)\frac{\partial \varphi_2\big(z(t_1, x_1)\big)}{\partial z}, \tag{36}$$

$$\Delta S(u) = -\sum_{x=x_0}^{x_1-1} \Delta_{\bar{u}(x)} M[x] + o_1(\|\Delta a(x_1)\|) + o_2(\|z(t_1, x_1)\|). \tag{37}$$

From (35), (36), using (15), (18) we get that (x) and $\psi(t, x)$ are solutions of following problems, correspondingly:

$$p(x - 1) = p(x) + \psi(t_0 - 1, x)B'(t_0 - 1, x), \tag{38}$$

$$p(x_1 - 1) = -\frac{\partial \varphi_1(a(x_1))}{\partial a}.$$

$$\psi(t - 1, x - 1) = A'(t, x)\,\psi(t, x) -$$
$$-B'(t, x)\,\psi(t - 1, x) - (t, x)\,\psi(t, x - 1),$$

$$\psi(t_1 - 1, x - 1) = B'(t_1 - 1, x)\,\psi(t_1 - 1, x),$$

$$\psi(t - 1, x_1 - 1) = C'(t, x_1 - 1)\,\psi(t, x_1 - 1),$$

$$\psi(t_1 - 1, x_1 - 1) = -\frac{\partial \varphi_2(z(t_1, x_1))}{\partial z}. \tag{39}$$

Due to the convexity of the functions $\varphi_1(a), \varphi_2(z)$ it's clear that

$$o_1\|\Delta a(x_1)\| \geq 0, o_2\|z(t_1, x_1)\| \geq 0.$$

Therefore, from (37) follows the inequality

$$\Delta S(u) \geq -\sum_{x=x_0}^{x_1-1} \Delta_{\overline{u}(x)}\,M[x]. \tag{40}$$

From relation (40) follows

Theorem 4. For the optimality of an admissible control (x) in problem (1)-(5), (32) enough that the inequality

$$\sum_{x=x_0}^{x_1-1} \Delta_{v(x)}\,M[x] \leq 0, \tag{41}$$

Is satisfied for every $(x) \in U, x \in \mathrm{X}$.

Proof. Let an admissible control (x) satisfies relation (41). Then inequality

(40) implies that for any admissible control $v(x)$

$$S(v) - S(u) \geq 0.$$

The last relation means the optimality of the admissible control (x). Thiscompletes the proof of Theorem 4.

Thus, in two cases it was possible to prove the necessary and sufficient optimalityconditions in the form of the discrete Pontryagin maximum principle.

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PHYSICAL SCIENCES

КОРОБКА ПЕРЕДАЧ ТРАНСПОРТНОГО СРЕДСТВА

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VEHICLE GEARBOX

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Аннотация
В работе представлены конструктивные методы по повышению безопасности коробки передач транспортного средства.
Abstract
The constructive methods of improving vehicle gearbox are presented in the work.
Ключевые слова: транспортное машиностроение, солнечная шестерня, коробка передач, шестерни.
Keywords: automobile construction, sun gear, gearbox, pinion.

Изобретение относится к транспортному машиностроению, в частности к коробкам передач, используемым для изменения скорости движения самоходных машин. Цель — улучшение и повышение безопасности. Коробка передач транспортного средства содержит корпус 1, входной 2 и выходной 3 валы, планетарный механизм 4 с коронной шестерней 5, водилом 6 и тремя солнечными шестернями 7, 8, 9, две муфты 10, 11, одна из которых установлена между корпусом 1 и солнечными шестернями 7, 8, а другая — между солнечной шестерней 9 корпусом 1 и водилом 6, двухпозиционное переключающее устройство 12, выполненное, например, в виде двух связанных зубчатых муфт 13. 14, в первой позиции связывающих с входным валом 2 коронную шестерню 5 и с выходным валом 3 водило 6, и во второй позиции связывающих с входным валом 2 водило 6 и с выходным валом 3 коронную шестерню 5. Кроме того коробка передач снабжена установленным с возможностью качания на неподвижной опоре рычагом управления, взаимодействующим концом с лунками трех ползунов, средний из которых увеличенной ширины связан с муфтой 11, и два крайних из которых, сблокированных, например, посредством связующей планки, связаны с муфтой 10, при этом перемещения рычага управления определены ограничительной кулисой с двумя Н-образными составляющими, соединенными перемычкой 25, а переключающее

устройство 12 снабжено вилкой для взаимодействия с рычагом управления 16 при его перемещении по перемычке 1 ил.

Коробка передач транспортного средства содержит корпус 1, входной 2 и выходной 3 валы, планетарный механизм 4 с коронной шестерней 5. водилом 6 и тремя солнечными шестернями 7-9, две муфты 10 и 11, одна из которых установлена между корпусом 1 и солнечными шестернями 7 и 8, а другая установлена между солнечной шестерней 9 корпусом 1 и водилом 6, и двухпозиционное переключающее устройство 12, выполненное, например, в виде двух связанных зубчатых муфт 13 и 14, в первой позиции связывающих с входным валом 2 коронную шестерню 5 и 6 выходным валом 3 водило 6, и во второй позиции связывающих с входным валом 2 водило 6 и с выходным валом 3 коронную шестерню 5. Кроме того, коробка передач снабжена установленным с возможностью качания на неподвижной опоре 15 рычагом управления 16, взаимодействующим концом 17 с лунками трех ползунов 18-20, средний 19 из которых увеличенной ширины связан с муфтой 11, и два крайних 18 и 20 из которых; сблокированных, например, посредством связующей планки 21, связаны с муфтой 10, при этом перемещения рычага управления определены ограниченной кулисой 22 с двумя Н-образными составляющими 23 и 24, соединенными пере-

мычкой 25, а переключающее устройство 12 снабжено вилкой 26 для взаимодействия с рычагом управления 16 при его перемещении по перемычке 25.

Предложенная коробка передач обеспечивает восемь передач, т.е. восемь скоростей движения транспортного средства. Положения рычага управления 16, соответствующие каждой передаче, обозначены на кулисе 22.

Первые четыре передачи обеспечиваются в первой позиции переключающего устройства 12 (показано на схеме). Первая передача — при связи посредством муфты 10 солнечной шестерни 7 с корпусом 1, вторая — при связи посредством муфты 10 солнечной шестерни 8 с корпусом 1, третья — при связи посредством муфты 11 солнечной шестерни 9 с корпусом 1, четвертая — при связи посредством муфты 11 солнечной шестерни 9 с водилом 6.

Для обеспечения вторых четырех передач рычаг управления 16 переводится через перемычку 25. При этом за счет его взаимодействия с вилкой 26 включается вторая позиция переключающего устройства 12. Пятая передача обеспечивается при связи посредством муфты 11 солнечной шестерни 9 с водилом 6, шестая — при связи посредством муфты 11 солнечной шестерни 9 с корпусом 1, седьмая — при связи посредством шестерни 10 солнечной шестерни 8 с корпусом 1, восьмая — при связи посредством муфты 10 солнечной шестерни 7 с корпусом 1.

Работа предложенной коробки передач рассмотрена с условием, что зубчатые венцы 27 и 28 коронной шестерни 5 и водила 6 выполнены с различным числом зубьев. В случае равенства чисел зубьев венцов 27 и 28 четвертая и пятая передачи обеспечиваются с равным передаточным числом, однако при этом благодаря синхронизации скоростей переключающего устройства 12 и венцов 27 и 28 обеспечивается возможностью переключения переключающего устройства 12 без остановки транспортного средства.

Таким образом, снабжение коробки передач транспортного средства устройством управления, выполненным в виде установленного с возможностью качания на неподвижной опоре рычага управления, взаимодействующего концом с лунками трех ползунов, средний из которых увеличенной ширины связан с муфтой, предназначенной для связи звена планетарного механизма с корпусом или другим звеном планетарного механизма, а два крайних связаны с муфтой, предназначенной для связи звеньев планетарного механизма с корпусом, при этом перемещения рычага управления определены ограничительной кулисой с двумя Н-образными составляющими, соединенными перемычкой в вершинах двух соседних продольных составляющих, а также снабжение переключающего устройства коробки передач вилкой для взаимодействия с рычагом управления при его перемещении по перемычке обеспечивают улучшение условий эксплуатации и повышение безопасности использования коробки передач транспортного средства.

Формула изобретения

Коробка передач транспортного средства по авт. св. № 1504110, отличающаяся тем, что, с целью улучшения условий эксплуатации и повышения безопасности, она снабжена устройством управления, выполненным в виде установленного с возможностью качания на неподвижной опоре рычага управления, взаимодействующего концом с лунками трех ползунов, средний из которых увеличенной ширины связан с муфтой, предназначенной для связи звена планетарного механизма с корпусом или другим звеном планетарного механизма, а два крайних связаны с муфтой, предназначенной для связи звеньев планетарного механизма с корпусом, при этом перемещения рычага управления определены ограничительной кулисой с двумя Н-образными составляющими, соединенными перемычкой в вершинах двух соседних продольных составляющих, а переключающее устройство коробки передач снабжено вилкой для взаимодействия с рычагом управления при его перемещении по перемычке.

На чертеже представлена коробка передач транспортного средства.

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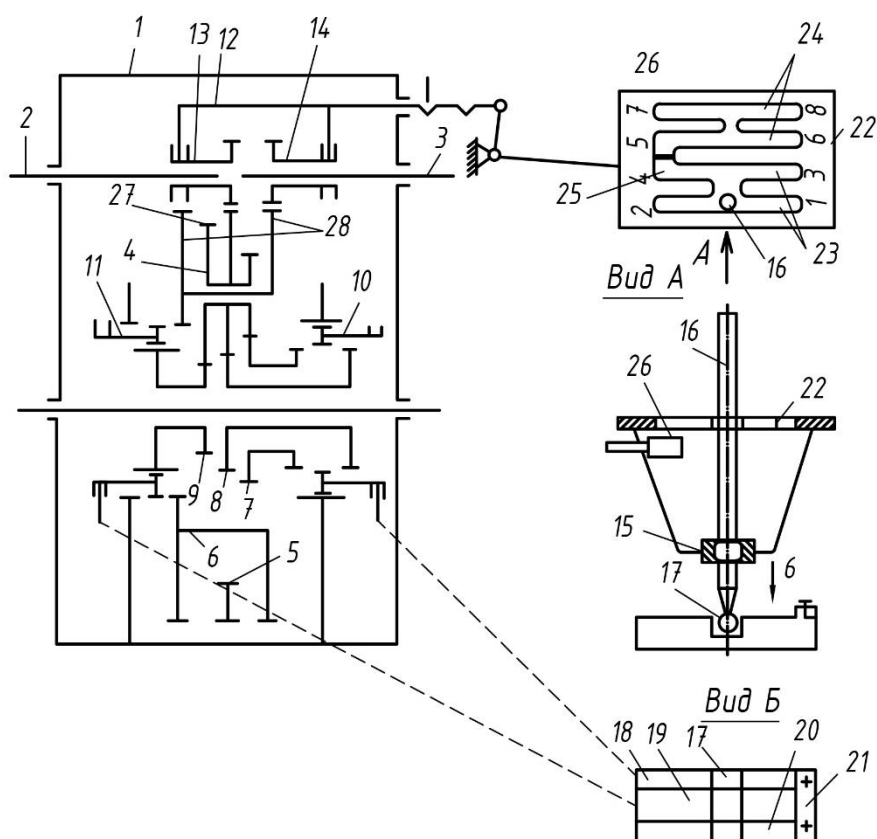
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PSYCHOLOGICAL SCIENCES

EARLY CARE FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS AND THEIR FAMILIES: THEORETICAL AND METHODOLOGICAL ANALYSIS

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Abstract

The article cited the problem of autism and scientific trends in early care. At the same time, the article provides scientific coverage of such concepts as social deficiency in a person, the formation of a physical defect in a person as a complex derivative of psychological, medical, social, economic and spiritual factors, in which children with autism syndrome belong to a person with special needs, modern interpretations of the definition of "early help" were covered. The benefits of "early care " not only for children, but also for families, were scientifically substantiated. The article scientifically analyzed the opinions and conclusions of scientists, specialists of research institutes on this problem.

Keywords: early care, autism, family, integrated care, systematic approach, defective child, social communication, development line.

Methods

Metodology

Autism is one of the severe types of mental disorder, which is manifested by trying to withdraw from others and not being able to express emotions in the way we are used to. Autism is caused by neurological disorders that directly affect the functioning of the brain. In most cases, autism appears in children under the age of 3, but most parents do not pay attention to its first signs. The signs of autistic disorder are more likely to appear at the age of 2-3 years. In the early stages of autism, the child does not respond to certain actions of the parents, and reacts to them with indifference. He cannot establish friendly and warm relations with the surrounding people, relatives, and their children. They do not respond to their parents' sweet words and caresses with a smile, they have the same attitude towards inanimate objects and people. Another key symptom is the inability to look others in the eye. They try not to catch the eyes of the people around them. Speech disorders, inability to speak, inability to play games that require a creative approach can also be signs of autism. Studies have shown that children with autism have homogeneity in their actions, sleep disorders, aggressiveness, and fear. What exactly causes autism in children has not been fully studied by scientists. Unlike Down, Patau, Marfan and other types of syndromes, no genetic anomalies are noted in the patient's body in autism. Experts say that in most children with autism, this condition is caused by difficulties during the birth process and pregnancy. When disturbances in brain activity begin to be observed, hyperactivity and a decrease in intelligence are noted in the patient. However, experts say that it is difficult to diagnose autism based on certain symptoms.

Participants

A doctor's help and a number of tests are needed to make an accurate diagnosis. The earlier the diagnosis, the sooner parents and professionals can start the treatment process. Some children with autism graduate from high school, learn a profession, and work in prestigious places. Nevertheless, it is very difficult for people with autism to trace their personal life and start a family. Experts suggest several methods for treating autism. According to them, it is necessary to provide all kinds of help to a young patient. During the treatment of the syndrome, great attention is paid to improving the child's relationship with parents and other family members, he is taught to overcome fear and fight against aggressive attacks. A lot of responsibility is required from parents of children with autism. The most important thing is not to take autism as a terrible sentence. Asperger's syndrome is a type of autism, in which the mental potential is preserved, the patient speaks with others, but cognitive functions work well, the symptoms of mental retardation are not visible, but it is difficult for them to adapt to the people around them. Children with Asperger's syndrome try to distance themselves from people, and they may not understand what they are saying. At the same time, his intellectual potential will not be inferior to that of children of the same age, and he may even surpass them in intellectual directions. Children with Asperger's syndrome are distinguished by their interest in a certain direction. For example, they can watch one show on TV endlessly, play only one of hundreds of toys endlessly. It has its own positive side, actually. A child with Asperger's syndrome is attentive to the activity he is interested in, and shows interest even in small details. Most of them achieve excellent results in mathematics, music, drawing.

Data Collection

Explaining the main features of the development of the human psyche with biological laws - heredity - is a mistake from a theoretical point of view. It causes great difficulties in practice. Because here the role of the educator is reduced. Age and pedagogic-psychology are based on the idea that the laws of human mental development are determined by the complex set of social conditions of child upbringing and life. This raises the question of what is the role of neurophysiological characteristics in the development of the biological conditions of development. Human mental activity is

very complex. Its characteristics depend on the up-bringing and life of the child. Logical memory, abstract thinking, perception of objects, etc., higher mental functions are not transmitted or strengthened by hereditary biological means. This allows to reconstruct and improve them in the process of historical development. In modern science, a fairly large number of interpretations of the definition of "early help" have been formed. Depending on scientific trends, ideas, and time periods, researchers distinguish different points of view. "Initially, early care was considered as a complex of services for medical, social, psychological and pedagogical services for infants and young children. Then this concept was supplemented, and later it was defined as a set of social network services that support families with young children and directly and/or indirectly affect the functioning of a family with a child as a whole. "By the mid-90s of the twentieth century, early care was considered as a model of psychological and social assistance, when the prevention of problems in the development of a child was considered more important than the correction of existing disorders. The end of the last century and the beginning of this century have confirmed the idea of early care as an integral part of a family-centered approach in the implementation of psychosocial care. Based on this approach, Western researchers formulate their definition of early care: "Early care can best be defined as a system created to support family patterns of interaction that most contribute to the development of the child"[1].

Ethical Considerations

According to a number of Russian researchers, "early care is a set of measures aimed at promoting optimal development, improving the health and well-being of infants, early and preschool children with disabilities and the risk of such restrictions, normalizing family life, increasing the competence of parents (legal representatives), including the child in the environment of peers and community life" [2, pp.4-5].

Researchers of the St. Petersburg Institute of Early Intervention have included in the concept of "early care" not only assistance to children, but also to their families. "Early assistance to children and their families is a complex of early assistance services provided on an interdisciplinary and interdepartmental basis to children of the target group and their families, aimed at promoting the physical and mental development of children, their involvement in natural life situations, the formation of positive interaction and relationships between children and parents/caregivers in the family as a whole, promoting the inclusion of children in the environment of peers and their integration into society"[3, p. 4-18].

Analytic Strategy

Early care for children with special needs pursues a number of goals inherent in the whole world:
• early detection of any abnormalities in the development of the child, as well as early prevention of the consequences of deviations;
• "formation and development of the ability of young children with disabilities or the risk of their occurrence to independent life in society;

• reducing the costs of special education for children and thus reducing the need for special education and care after they reach school age;
• providing assistance to parents in creating optimal conditions for the development and education of a child in a family and local community;
• increasing the level of competence of parents and other family members, leading to the expansion and strengthening of their capabilities to meet the special needs of their child;
• promotion of social integration of family and child"[4, p. 8].

This type of assistance is also provided to children with autism, under the age of three, with risk factors in development. Children with ASD and families raising children with such a diagnosis can receive the necessary support in educational, health, social protection institutions and is organized in accordance with the procedure established by law. "Autism spectrum disorders (ASD) are a group of disorders characterized by qualitative deviations in social interactions and sociability indicators, as well as a limited, stereotypical, repetitive set of interests and actions" [5]. Currently, many researchers use the generalized name of authentic conditions of children as "autism spectrum disorders". This is due to the fact that each category of disorders included in this spectrum has many different features, but all of them, one way or another, are derivatives of the same disorder. The starting point for substantiating the approach that allows us to understand and evaluate the true essence of a complex, multidimensional and multifaceted phenomenon, such as early care, was the idea of it as an integral social system. A system is a complex of objects, as well as the relationship between objects and their attributes (definitions). Objects are components of a system, attributes are properties of parts, and relationships bind the system together. The systematic approach creates conditions for the consistent solution of research tasks by considering the phenomenon of early care through the prism of its role, place, value-target orientations and functions in a more complex system of different countries – the social system, due to a holistic, integrative and targeted vision of the object and the management system, their connections and development [6]. Starting from 60-70.

Analysis

In the twentieth century, projects, programs, and various initiatives in support of early assistance to children with developmental disabilities and their families developed rapidly in the United States, so this country can rightfully be considered the birthplace of the definition and development of early assistance to children with autism spectrum disorders and their families. During this period, a new understanding of human rights and the rights of persons with disabilities begins to form in American society against the background of economic recovery and the beginning of the transition from an industrial to a post-industrial society. The approaches, concepts, and scientific ideas described in various psychological directions about the development of the infant served as the foundation for the formation and development of the early care system.

Thus, S. Freud, a representative of the classical psychoanalytic school, believed that "social ties and relationships between mother and child are interpreted as a transformation of libidinal tendencies"[1]. In his opinion, a child is initially born with a sexual attraction, the so-called "libido". Since parents are the first people who attract the child's attention, they become the first objects of libido. Starting from the age of 3-5 years, a child experiences attachment to a parent of the opposite sex, such attachment is S. Freud defined both the Oedipus complex in boys and the Electra complex in girls. The resolution of these complexes leads to the identification of a child with a parent of the same sex and the internalization of parental prohibitions, moral norms and models of gender-role behavior. After the end of the Second World War, when most children were separated from their mothers and other family members, psychoanalysts raise the problem of the infant's connection with the mother. In this context, S. Freud developed the concept of the line of development. The main idea of the concept is that the child is helpless from birth, completely attached to the mother, then from the moment of growing up gradually becomes emotionally self-sufficient and independent. S. Freud's ideas and his daughters formed the basis of Margaret Mahler's theory of child individualization. Within the framework of this theory, children go through 3 stages of formation as a person. The very first stage, which according to the theory is called autistic, the child passes from birth (the 1st month of life), he is characterized as a biological being. The child's behavior is primitive and non-integrated. At the second stage (symbiotic, 2-5 months), the child merges with the mother. The third stage is the individualization of the child, i.e. the separation of the child from the mother. Psychologist John Bowlby, within the framework of his theory of attachment, proved the connection between the relationship of mother and child for the further development of the latter. The central idea of attachment theory is that the immediate environment, which initially takes care of the baby, responds to his needs and satisfies them, allows the child to feel safe. The infant knows that this or that adult is reliable, and this gives him support for further knowledge of the world. The researcher argued that there is some kind of connection between the mother and the baby, the rupture of this connection leads to a violation in mental development, as well as in the structure of the child's personality. John Bowlby argued that children who have had proper maternal care show a higher level of self-confidence and ability to adapt to environmental conditions. The following approaches that have influenced the development of early care are behavioral and non-behavioral approaches. The first approach is characterized by the concept of "learning". The infant acts "as a natural being, adapting by learning to the conditions of individual life on the basis of the presence or absence of reinforcement." The second approach is characterized by the concepts of "social learning", "social reactivity" and "social reinforcement". The main advantage of this approach is "the clarity of the experimental formulation of the problem and the accumulation of a large amount of factual material characterizing the child's capabilities and their expansion during the first year of life, considering the child in interaction with an adult"[1]. The concept of the German psychologist D. Stern supplemented the knowledge about early development. The main idea of his concept was that first children develop perception, then memory and only then thinking. "The provisions of the concept served as the basis for the creation of a psychotherapeutic approach focused on the mother–infant system. The spheres of healthcare, social protection, as well as special education in the USA at the turn of the 60s had a significant impact on the formation of the system of early care for children and their families. Children from the earliest age, as well as their families, receive assistance directly in health care institutions. This assistance includes consultations and receptions of doctors of various profiles: pediatricians, neurologists, psychiatrists, ophthalmologists, physiotherapists, speech therapists and other specialists. M. Seligman and R.B. Darling in their book "Ordinary families, special children" (2007), said that during the 60s of the XX medical care it was focused mainly only on a sick child who was a patient of the health service. With this approach, only specialists decided what was best for the child, and the family was provided with the necessary information about the course of the diagnostic process or treatment of the child, and such treatment was carried out within the walls of medical institutions. Thus, the family practically did not participate in the recovery of their children. During the course of medical procedures, the family was given recommendations on daily child care, but despite this, they were mostly of a general nature. With this approach, the family was obliged to follow the recommendations of specialists. The negative perception of children with special needs, as well as the relationship between specialists and parents, prompted specialists to consider the child's family members as a "second patient". The parents were assigned the "role of the patient" – to be ready for cooperation, to agree with all the opinions and decisions of professionals. According to researchers M. Seligman and R.B. Darling, the 60s of the last century combined a clinical approach with an emphasis on "placing blame on the victim" and a professionally dominant approach in order to suppress the resistance of parents of children with special needs. But soon such a position of the association undermined the trust and respect for the specialists of medical institutions. Since 1950, studies have been conducted to assess the public's trust in healthcare professionals. It turned out that since the 1950s, the level of public confidence in medical personnel began to decline, and by 1975, only 43% of the population treated medical personnel with respect and trust [6]. Considering many factors that served as prerequisites for the creation of an early care system in the United States, a number of researchers identified the first experiments on family-oriented care organized in the healthcare system. These are the Cornell project (1939-1941) and the Montefiore Medical Group project (1950-1959) [1]. In 1939, the Cornell Project was launched in New York. The meaning of it was to identify the relationship between health and climate in the family. 15 families were involved in the project, and it took two years to collect and analyze

the data. Due to the outbreak of World War II, the project was interrupted. After the end of the war, the Montefiore Medical Group project (1950-1959) was launched. The main purpose of which was to determine the possibility of preventing the disease in a family member by working with the whole family as a whole. The project involved 100 families and a large group of specialists of various profiles. However, analyzing the data of the Montefiore Medical Group project, researchers M. Seligman and R.B. Darling, noted that the potential of the project was not fully realized, and this was due to specialists who did not want to expand their professional activities by taking on new roles that were not characteristic of their profession. The reason for the development of early assistance programs for children with special needs was the programs implemented in the 60s and 70s for children from low-income families. Programs were developed for teaching children with developmental disabilities, approximately up to the age of third grade, and were implemented by both non-profit and state institutions. This is how the system of early assistance to children with special needs began to emerge. The early assistance program included a wide variety of problems: "problems of early education of children; problems of support and support of family members of a special child; stimulating the development of infants and the education of their mothers; family rehabilitation programs; programs for the care of children and adolescents, etc. [1, p.25]. At the very beginning, early care was provided point-by-point and was not organized in all states of America, it was mainly supported by parent associations, groups and associations. Then, with the achievement of good results of early assistance to children with disabilities and their families, early assistance programs began to spread throughout the country, which laid down a mechanism for interaction between various departments at the state level or interaction between non-governmental non-profit organizations and government agencies [1, p.25]. In society during this period, there is a rethinking of the attitude towards children with special needs. "The main value orientations of the new philosophy began to cover the following areas of the life of the child and his family: the creation of normal living conditions for the child in the family; the creation of conditions for the development of the child together with the family: the presence of developing communication, play environment, special and developmental activities, information, education and training of family members in order to provide the maximum possible assistance to the child; creation of a normal social environment surrounding the child in the family and outside it, when visiting a kindergarten, a developmental center, a clinic, etc." [1, pp.25-26]. With the development of the system of early assistance to children with special needs, there is a special literature describing various technologies of assistance, methodological approaches, giving recommendations to specialists, as well as parents raising special children. The most popular were the management of "Portage" and the management of "Carolina". The programs are aimed at supporting young children (from birth to 2 years old) with developmental disabilities. Programs solve the problem of developing

a special child in two ways. "Firstly, the skills in each area of development are divided into logical sections of training. Secondly, the content of many sections included changes for children with sensory and motor limitations"[1, p. 26]. Russian researcher N.S. Groznaya, coordinator of editorial and publishing activities of Downside Up, in her article identified three stages in the formation of early care for children with disabilities. The first period of the history of the development of early care falls on the late 1950s - early 1960s. This period is associated with the period of development of programs for low-income families. The first program was "Head Start", which in translation meant "a starting leap", aimed at combating poverty. During this period, large monetary investments are noted for the development of various social programs. However, due to the lack of a reliable regulatory and theoretical framework, waste and investments were inevitable. The same thing happened in the second period (late 1960s- early 1970s). The third period in the history of early aid formation (1970s-1980s) was financially limited, but despite this, huge strides were made in the development of early aid. The implemented social programs during this period were based on studies of the development of young children. Since the 70s, a large amount of specialized literature on early intervention and assistance to children with special needs and their families has been published [7, pp. 3-8]. At the present stage in Russia, the system of early care is at the stage of formation. "The formation of a system of early diagnosis of developmental abnormalities and early comprehensive care occurs through the development of a system of medical, psychological and pedagogical patronage, which is carried out on the basis of existing psychological, medical and pedagogical centers and psychological, medical and pedagogical consultations and services"[8]. A number of scientists, such as V. M. Bekhtereva, N. M. Shchelovanova, N. I. Kasatkina, N. M. Askarina, laid the foundation for the formation of early aid in our country. In their works, the researchers described the factors that influence the formation of a child's personality at an early age. They emphasized the importance of an adult on the formation of a child's personality, their relationship [9]. Thus, summing up the first paragraph, we can say that the concept of "early help" has different interpretations. This term can be viewed from various points of view: as an ideology and model of psychosocial care; as a social program with its own strategic plan; as a system of technologies; as a complex of diagnostic and correctional processes; as a set of measures for rehabilitation, habilitation of an interdisciplinary team of specialists; as a social policy. "Autism Spectrum Disorders (ASD) is a group of disorders characterized by qualitative deviations in social interactions and indicators of sociability, as well as a limited, stereotypical, repetitive set of interests and activities" [10]. Currently, many researchers use the generalized name of the authentic conditions of children as "autism spectrum disorders". This is due to the fact that each category of disorders included in this spectrum has many different features, but all of them, one way or another, are derivatives of the same disorder.

The starting point for substantiating the approach that allows understanding and evaluating the true essence of a complex, multidimensional and multifaceted phenomenon, which is early assistance, was the idea of it as an integral social system. A system is a complex of objects, as well as relationships between objects and their attributes (definitions). Objects are the constituent parts of the system, attributes are the properties of the parts, and relationships bind the system together.

The systematic approach creates conditions for the consistent solution of research problems by considering the phenomenon of early assistance through the prism of its role, place, value-target orientations and functions in a more complex system of various countries - the social system, due to a holistic, integrative and targeted vision of the object and the control system, their connections and development [11].

Starting from the 60-70s. In the 20th century, projects, programs, and various initiatives to support early intervention for children with developmental disabilities and their families were rapidly developing in the United States, so this country can rightly be considered the birthplace of the definition and development of early intervention for children with autism spectrum disorders and their families. During this period, in American society, against the backdrop of economic recovery and the beginning transition from an industrial to a post-industrial society, a new understanding of human rights and the rights of persons with disabilities is beginning to form. Approaches, concepts, scientific ideas about the development of an infant described in various psychological directions served as the foundation for the formation and development of the early assistance system.

Thus, Z. Freud, a representative of the classical psychoanalytic school, believed that "social ties and relationships between mother and child are interpreted as a transformation of libidinal tendencies" [12]. In his opinion, a child is initially born with a sexual desire, the so-called "libido".

Since the parents are the first people to attract the child's attention, they become the first objects of the libido. Starting from the age of 3-5 years, the child experiences attachment to the parent of the opposite sex, such attachment Z. Freud defined as the Oedipus complex in boys and the Electra complex in girls. The resolution of these complexes leads to the identification of the child with a parent of the same sex and the internalization of parental prohibitions, moral norms and models of gender-role behavior. After the end of the Second World War, when most children were separated from their mothers and other family members, psychoanalysts raise the problem of the infant's connection with the mother.

In this context, A. Freud developed the concept of the line of development. The main idea of the concept is that a child is helpless from birth, completely attached to his mother, then from the moment of growing up he gradually becomes emotionally self-sufficient and independent.

The ideas of Z. Freud and his daughter formed the basis of Margaret Mahler's theory of individualization of the child. Within the framework of this theory, children go through 3 stages of formation as a person. The very first stage, which according to the theory is called autistic, the child goes through from birth (1st month of life), he is characterized as a biological being.

The child's behavior is conspicuous and unintegrated. At the second stage (symbiotic, 2-5 months) merges the child with the mother. The third stage is the individualization of the child, i.e. separation of the child from the mother.

Psychologist John Bowlby, as part of his theory of attachment, proved the connection between the relationship between mother and child for the further development of the latter. The central idea of attachment theory is that the immediate environment, which initially cares for the baby, responds to his The baby knows that this or that adult is reliable, and this gives him support for the subsequent knowledge of the world. The researcher argued that there is some kind of connection between the mother and the baby, the rupture of this connection leads to a violation in mental development, as well as in the structure of the child's personality. John Bowlby argued that children who were properly maternally cared for showed higher levels of self-confidence and adaptability to environmental conditions needs and satisfies them, allows the child to feel safe. The next approaches that influenced the development of early intervention are the behavioral and non-behavioral approaches. The first approach is characterized by the concept of "learning". The infant acts "as a natural being, adapting by learning to the conditions of individual life on the basis of the presence or absence of reinforcement." The second approach is characterized by the concepts of "social learning", "social reactivity" and "social reinforcement".

The main advantage of this approach is "the clarity of the experimental formulation of the problem and the accumulation of a large amount of factual material characterizing the child's capabilities and their expansion during the first year of life, the consideration of the child in interaction with an adult"[12].

The concept of the German psychologist D. Stern supplemented the knowledge of early development. The main idea of his concept was that children first develop perception, then memory, and only then thinking. "Regulations concepts served as the basis for the creation of a psychotherapeutic approach focused on the mother-infant system. Significant influence on the formation of the system of early assistance to children and their families was provided by the spheres of health care, social protection, as well as special education in the United States at the turn of the 60s. Children from a very early age, as well as their families, receive assistance directly from health facilities. This assistance includes consultations and appointments with doctors of various profiles: pediatricians, neurologists, psychiatrists, ophthalmologists, physiotherapists, speech therapists and other specialists. M. Seligman and R.B. Darling in his book "Ordinary Families, Special Children" (2007), said that in the period of the 60s. XX medical care was focused mainly only on a sick child who was a patient of the health service.

Discussion

With this approach, only specialists decided what was best for the child, and the family was provided with the necessary information about the progress of the diagnostic process or treatment of the child, and such treatment was carried out within the walls of medical institutions. Thus, the family practically did not participate in the recovery of their children. In the process of carrying out medical procedures, the family was given recommendations on the daily care of the child, but despite this, they were mostly of a general nature. With this approach, the family was obliged to follow the recommendations of specialists. The negative image of children with special needs, as well as the relationship between specialists and parents, has led specialists to consider members of the child's family as a "second patient". Parents were entrusted with the "role of the patient" - to be ready for cooperation, to agree with all the opinions and decisions of professionals. According to researchers M. Seligman and R.B. Darling, 60s of the last century, a clinical approach with an emphasis on "putting the blame on the victim" and a professionally dominant approach have been combined in order to suppress the resistance of parents of children with special needs.

But soon this position of the association undermined the trust and respect for the specialists of medical institutions. Since 1950, studies have been carried out to assess the trust of the population in health care professionals. It turned out that since the 1950s, the level of public confidence in medical personnel began to decline, and by 1975, only 43% of the population treated medical personnel with respect and trust. Considering the many factors that led to the creation of the early intervention system in the United States, a number of researchers have identified the first experiments in family-oriented care organized in the health care system. These are the Cornell project (1939–1941) and the Montefiore medical group project (1950–1959) [12].

Summarizing the information from modern sources, the clinical and psychological symptoms characteristic of children's autism syndrome can be given as follows:
- communication disorder;
- disruption of social and emotional relationships;
- imagination disorder;
- behavior disorder;
- speech disorder;
- disturbance of cognitive processes.

Each of these signs is manifested in children in its own way. For example, communication disorder in an autistic child can be determined by his/her unwillingness or inability to communicate with others, lack of attention to the interlocutor during communication, lack of open expression of feelings, or lack of interest in expressed feelings. You can get more detailed information about the origin and symptoms of this syndrome through modern scientific and educational literature created by researchers and specialists of our country.

Children's autism is one of the unique problems of special pedagogy. The reason is that the above-mentioned features have a negative impact on the mental and physical development of children, and hinder their socialization and integration processes.

In modern special pedagogy, there are many studies on correctional work with children with autism syndrome. In the following years, it is possible to observe a significant revival of this process in the CIS countries, in particular in Russia. At the same time, it cannot be denied that there is a need for scientific and practical research in Uzbekistan related to this syndrome in the medical, psychological and correctional-pedagogical fields in accordance with modern requirements.

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Usually, 3 areas of autism are clearly and clearly manifested:
- speech and communication;
- entering into social relations;
- imagination, emotion.

Difficulties with communication and socialization, lack of ability to establish emotional connections, disorders in speech development are explained as the main symptoms of autism, but it is also worth noting that autism affects every area of the psyche - mental and emotional, or Anomalous development of areas such as perception, motor skills, attention, memory, and speech is characteristic.

Despite the generality of disorders in the mental sphere, autism manifests itself in different forms. The book "Autistic child: ways to help" by O.S. Nikolskaya, Ye.R. Bayenskaya, and M.M. Lieblings gives examples of different approaches to distinguishing autistic children. According to him, the English researcher Dr. L. Wing divided such children into types such as "lonely" (does not seek to communicate), "passive" and "active, but clumsy" according to their ability to engage in social relations. lib explains. According to him, the group with a high probability of achieving social adaptation is the category of "passive" children. They propose to accept as a basis the classification according to the methods of being able to enter into communication and protection from it. They distinguish the main 4 forms of autism:

1. Complete indifference to the happening events, detachment from existence. Children with this form of autism show many deficiencies in their development and disturbances in their activity during early childhood. Later, they completely refuse to actively communicate with the outside world. Such children do not respond to the calls or appeals of others, they do not ask for anything, they do not develop goal-oriented behavior. They do not use speech and gestures and symbols. This is a severe form of autism, manifested in the child's complete detachment and indifference from the events around him.

2. Active rejection. Children of this group are relatively more active and less reluctant to communicate

with others, but they do not accept a large part of the world. For such children, it is very important to follow established life habits and established behaviors in a serious manner. They need to be surrounded by a familiar environment all the time, so their problems get worse as they get older - when it is necessary to get out of the inner environment of the house to a different external environment, to adapt, to communicate with new people. They have different movement habits. They can use speech, but their speech development is unique: first of all, they learn certain common words strictly associated with a specific situation. They seem to have a telegraphic style.

3. Preoccupation with autistic interests (or obsession). Children of this group are distinguished by their tendency to create conflict situations, not knowing how to take into account the interests and interests of others, and "immersing themselves" in the same activities and interests. These children are very "smart" and have a large vocabulary. However, they speak with very complex, "bookish" expressions, even their speech resembles the dull speech of adults. Despite their intellectual abilities, their ability to think is impaired, they cannot feel the essence and fundamental meaning of the situation, they have difficulty understanding the contents of several events that are happening at the same time.

4. Communicate and interact with too many difficulties. Lack of opportunities to establish relationships with other people is one of the central problems for children in this group. These children are characterized by difficulties in acquiring motor skills, their vocabulary is limited, their sentences are grammatically incorrect, they "lose themselves" in normal social situations. can "eat". This is one of the milder forms of autism.

According to statistics, autism in a deep form can be found in only one child out of a thousand. In everyday life, in preschool or school, we usually only come across children with some specific autistic symptoms. Autism is 4-5 times more common in boys than in girls.

Conclusions

The constructed model of organizing early care for children with autism and their families shows interdepartmental interaction between organizations (health, social protection, preschool education, non-profit organizations). All work of organizations in the field of early intervention should be based on the following basic principles:

•geographic and financial accessibility. Services should be accessible to the public and respond to the needs of the family raising a child with autism. The ability to easily and quickly get to social services, this is especially true for families living in rural areas;

• interdisciplinary work. The work of specialists in various fields providing early intervention services should be accompanied by a constant exchange of information and be based on partnerships;

• variety of programs and services. Comprehensive development of young children with autism spectrum disorders;

• relationship between professionals and families in providing early assistance to children with autism.

The model for optimizing the organization of early intervention for children with autism spectrum disorders and their families has two levels of delimitation of powers: regional and organizational level.

The first level (regional) includes the interaction of various departments: the Ministry of Health, the Ministry of Education and Science, the Ministry of Labor and Social Protection, and the Ministry of Economic Development.

This level is managing and coordinating, which implements the principles of public administration and performs the following functions:

1) management and coordination of activities of subjects of early intervention at the regional level;

2) organizational, informational, personnel, software and methodological support for the functioning of early aid,

3) regulatory and legal regulation of the activities of subjects of early intervention;

4) monitoring the effectiveness of early intervention for children with autism and their families. At the second level (level of organizations) carries out activities for providing timely entry of a family with a child with ASD into the system of early care, providing qualified medical, rehabilitation, habilitation assistance, as well as to determine the best ways to further preschool education or receive services in the field of additional education. Activities are carried out by the following organizations:

1) Organizations of the healthcare system (children's polyclinics, hospitals, maternity hospitals and other medical centers) are a key element in organizing early care for children with ASD. As soon as a diagnosis is made in a child, parents are immediately provided with information about the diagnosis, information is provided, i.e. addresses and telephone numbers of organizations involved in early intervention, so that parents do not waste time, but get involved in early intervention as soon as possible. Functions of organizations: early identification of needy families; complex diagnostics; treatment of existing disorders and prevention of secondary disorders; Information support.

2) Organizations of the social protection system and non-profit public organizations (rehabilitation centers for children, comprehensive centers for social services for the population, non-profit public organizations, foundations for supporting children with special needs, parent associations). The key task of these organizations is to create optimal conditions for the mental and social development of a child with autism spectrum disorders, to stimulate his potential in the process of special correctional and developmental influence and interaction of the child with parents and the outside world. Parents, especially those living in rural areas, should be given the opportunity to receive an on-lane consultation from a psychologist. The main goal of Itenrnet coaching is to help parents form a positive parenting attitude, which consists in unconditional acceptance of a child. The final stage of early assistance should be the transition to preschool educational institutions. Functions of organizations: social. rehabilitation; legal support; material support; parent coaching,

incl. through Internet technologies, information support.

3) Organizations of the education system (kindergartens, private educational centers). The early intervention program should end with the transfer and admission of the child to kindergarten. Functions of organizations: pre-school education: inclusive or special; additional education.

Early Assistance" - a set of medical, social, psychological and pedagogical services provided on an interdepartmental basis to children of the target group and their families, aimed at early identification of children of the target group, promoting their optimal development; Early Assistance is a family-centered program that aims to help not only the individual child, but also support the entire family.

The formation and development of the early intervention system for children with autism spectrum disorders was influenced by psychological concepts, scientific ideas about the development of the infant: the theory of individualization of the child (M. Mahler), attachment theory (J. Bowlby), behavioral and non-behavioral approaches.

The organization of early intervention in our country is based on family-centered work, including an interdisciplinary team of specialists operating on the basis of the healthcare system, education, social protection, and non-profit organizations. Since 1999, networks of early intervention services have been established on the basis of regional experiments.

They are represented in Samara and Novgorod, Nizhny Novgorod, Novosibirsk, Krasnoyarsk, Omsk regions, in St. Petersburg, Moscow. On the initiative of individual specialists, more than 400 different early intervention services for children operate in the Russian Federation.

As found in empirical research, the main steps in early intervention for children with autism spectrum disorders and their families are:

1) diagnostics 2) rehabilitation and habilitation

3) counseling parents about the characteristics of the child's development.

During the analysis of semi-structured interviews with specialists and parents, the advantages and disadvantages of organizing early assistance for children with autism spectrum disorders and their families were highlighted.

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SOCIAL SCIENCES

THE IDENTITIES OF REPATRIATED MUSLIM MESKHETIANS IN GEORGIA

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Abstract

Displacement, the forced change of one's living place, has influenced the cultural and ethnic identity of many peoples' lives. This study examines the life of Muslim Meskhetians, people deported from Georgia to the central Asian republics of the Soviet Union in WWII by Stalin's social policy as "undesirable people".

After 1956 some Muslim Meskhetian families tried to return to their homeland. Formal repatriation of Muslim Mesketians to Georgia started in 1977. The first wave of repatriated Muslim Meskhetians mostly settled in villages near Samtredia and Ozurgeti. After starting implementation of a new repatriation law in 2012, which was adopted in 2007, repatriated Muslim Meskhetians are living in different districts of Georgia, even in their original homeland in the South-West. Based on theoretical concepts of ethnic identity, place identity, and on the quantitative and qualitative research methods the study analyses of *social identity complexity* (ethnic, civil, and place identity) of Muslim Meskhetians living in Georgia.

Keywords: Ethnic identity; Muslim Meskhetians; Civil Identity; Place identity; Ahiska Turks.

Author's Note: *Throughout history, the population I refer to in this study as "Muslim Meskhetians" have been known by many names. Some researchers refer to this population as "Meskhetian Turks," or "Turks from Meskhetia." Oftentimes, they call themselves "Ahiska Turks' ' (which means Turks from Akhaltsikhe, a central town in Meskheti and part of southwestern region of the Republic of Georgia near the Turkish border). I refer to this population as Muslim Meskhetians, because they are the deported Muslim population from Meskhetia.*

Introduction

Muslim Meskhetians from the South-Western part of Georgia were deported during WWII and scattered around post-soviet republics. Once there, they worked to adapt to each distinct social environment. According to migration researchers, new social environments influence human lifestyle and social identity formation. Integration is the best way for people in a new environment to adapt *(Berry, 1997).* Several factors can work to support the integration process of displaced persons: their individual skills, their willingness to learn the new language, and their culture (Sam., Berry (2006); Berry (2001); Sammut (2010); Padilla (2004).

The adaptation-integration process in the new environment has an impact on an emigrant's human identity. The formation of identity during the life of an individual is an important process. Identities can shift and transform over time and as contexts change and individuals may consider themselves members of a variety of different social identity groups over the course of a lifetime. (Schwartz, Luyckx, and Vignoles 2013). (Moscovici, 1981).

Many factors dictate an individual's social identity, including social environment, the perception of others, and the roles within primary and secondary social groups. The study of the process of identification takes on special significance when people change their living environment (Sam & Berry, 2006). Under these circumstances, it is possible to witness how individual ethnic, cultural, and place identities change as a result of migration. Moreover, social identity can be impacted by civic consciousness in the new environment and an emigrant's feelings towards the local society. (Tajfel & Turner, 1979).

This descriptive study presents qualitative and quantitative data on repatriated Muslim Meskhetians inhabiting the Republic of Georgia in order to demonstrate the influence of adaptation and integration on their identities. I seek to contribute to this body of literature by examining of social identity complexity of Muslim Meskhetians living in Georgia a detailed analysis of ethnic, civil, and place identity.

About Muslim Meskhetians

The Republic of Georgia was occupied by the Ottoman Empire between 1578 and 1883. Consequently, their religion, way of life, and language changed and they transformed from Georgian-speaking Orthodox Christians to Turkish-speaking Muslims. Despite the fact that Turkish is the primary language of Muslim Meskhetians, both Turkish and Georgian cultural traits are equally identifiable in their cultural identity. (Baramidze, 2011; Janiashvili, 2006)

According to researchers Trier and Khanzhin, Muslim Meskhetians have been known by numerous names over the course of history (2007). Historical records indicate that they were referred to as Georgians [born in Russian-Empire Caucasian Province before 1917 or Socialist Republic of Georgia after the revolution]. Muslim Georgians [a small religious minority in Soviet Georgia where Christianity was predominant], Muslim Meskhetian Turks [dwelling in specific regions throughout Georgia - Meskhetia, and their genealogical links with the Ottomans]. Meskhs [highlighting their geographical district only], Turks [unlike Meskhs highlighting genealogical roots as the key identity marker], Azeri [Soviet administrative classification based on the

religious and linguistic affiliation between Azeri and Turks], Meskhetian Turks [the Stalinist name given to the group later], Ahitska Turks / Akhaltsikhe Turks {the most up to date name the US-based society obtained].

Dating back to ancient times, Muslim Meskhetians and Orthodox Christian Georgians have shared residence in the Caucasus, including southwest Georgia near the Turkish border. In 1578-1883 AD, this territory was invaded by the Ottoman Empire. As a result of colonization, the inhabitants of Meskheti, Javakheti converted from Orthodox Christianity to Sunni Islam, alongside a shift in language from Georgian to Turkish. After the war between Russia and Turkey (1877-1878), the Ottomans fled from the region and Meskheti later became an integral part of Russia with significant signs of Islamization. Further cataclysmic changes were brought by the Bolshevik Revolution in 1917. For a very limited period, between 1918 and 1921 Georgia was independent. Afterward, the second conflict with Bolshevik Russia brought the loss of independence and Georgia's integration into the USSR. During these politically inconsistent times, the majority of local Muslims allied with the Ottomans and migrated to Turkey (Sumbadze, 2007) (Maglakelidze, 1994; Nozadze 1989). Some Muslim Meskhetians left the borders of the Soviet Union and those who stayed were targeted for Sovietization campaigns.

The Soviet aimed at combining all Muslim-practising nationalities under one unit. All local Turkish-speaking Islamists were referred to as "Azeri" in public documents by the new administration. Muslim Meskhetians, the Khemshis (Muslim Armenians) and Kurds from Georgia were all referred to as "Azeri" in those documents. This way, the Soviets consciously combined Turkish-speaking Georgians with their next-door neighbors, the Azerbaijani. This enabled the Soviets to open Azeri-language schools in Georgia to educate the Muslim youth (Sumbadze, 2007).

During WWII, a wave of mass deportations was initiated by the Soviet Union. The resolution No 6279 issued by the USSR Defense State Committee on July 31st, 1944 and the order N00117 issued by the Ministry of the Internal Affairs on September 20th in the same year were designed to deport 19,818 families from the Georgian SSR, including Turks (14,493 families); Kurds (1,830 families); Azerbaijanians (3,058 families); Yazidis (7 families); Tatars (126 families), and Khemshis/Muslim-Armenians of Laz origin (304 families) (Trier & Khanzhin, 2007). All of the aforementioned Turkish-speaking Muslim groups were forced into cargo-carrying carriages and moved thousands of kilometers away on November 15th, 1944.

Men were mostly mobilized to serve the Red Army of Eastern Front against the Nazis and the women, children and elderly were relocated within Soviet republics of Uzbekistan (roughly 53,163 people), Kyrgyzstan (28,598), and Kazakhstan (10,546) (Bugai, 1994; Sumbadze, 2007). Around 92,307 inhabitants were deported from five administrative districts of Southern Georgia – Samtskhe and Javakheti. Since a great number of people died in the process of their de-

portation, the experience was extremely traumatic. Deported families were not permitted to return to their homes or retrieve their belongings for over four decades. The psychological trauma caused by mass deportation is both deep and pervasive, affecting the social lives of the affected people were shaken again by the new conflict with the local Central Asian population. (Bessel, at all 1987; Ciano 2017)

In 1989, out of 207,500 Muslim Meskhetians who lived in the Soviet Union, over 51.2% were from Uzbekistan (Babak, Vaisman &Wasserman 2004;252). Most Meskhetians moved to Fergana Valley. In June of 1989, a massacre broke out in the Uzbek section of the Ferghana Valley resulting in the death of dozens of Meskhetians (Yunusof 2000;92). The real reason for the massacre is still vague. Following the Soviet Army intervention, the situation was more or less stabilized. However, 17,000 Muslim Meskhetians were instantly evacuated by the Soviet Army troops, causing an outflow of Muslim Meskhetians from Uzbekistan over the next few years. Over 60,000 Meskhetians are estimated to have left after the initial evacuation. Hence, they went through the second inadvertent relocation 45 years after Stalin's deportation. Some Muslim Meskhetians were left homeless (Aydingün, 2002). Others moved to Azerbaijan or Russia, in the Krasnodar region bordering Georgia. A select number of formerly-deported Muslim Meskhetians were able to return to Meskhetia (Ossipov, 2002, Koriouchkina, 2009).

After the Soviet Union dissolution, the Russian Federation ceased issuing Russian-citizenship passports to Muslim Meskhetians, rendering them "illegal" immigrants throughout the territory of Russia. Repatriation to Georgia was not a solution thereupon, neither pragmatically nor legislatively. The U.S.A. offered "refugee" status to all Muslim Meskhetians living in Krasnodar, Russia. Consequently, beginning in 2005, Muslim Meskhetians began relocating into thirty-three of the fifty U.S. states (Koriouchkina & Swerdlow, 2007).

Generally, scholars studying cultural adaptation have come to the following conclusion: the longer a refugee lives away from the homeland the more their cultural values, traditions and lifestyle transform. However. it is worth pointing out that Muslim Meskhetians are often described as unique, having successfully retained many of their cultural attributes despite multiple forced migrations and dislocation experiences (Trier & Khanzhin, 2007).

Today, Muslim Meskhetians live around the world and as part of their integration, they have gained new identities for themselves. For instance, those who live in Azerbaijan identify largely as Turks (Yunusof, 2000), while others, strongly reject any connection with Turkey and highlight their differences, claiming a strict Georgian identification (Sumbadze, 2007). Since their relocation to the United States, they created yet another immigrant ethnic identity, that of the *Akiska Turks*.

In the studies of Avci (2012) and Bal and Arzubiaga (2013), Muslim Meskhetians are referred to as their ascribed identity *Ahiska Turks*. Preceding these studies, however, non-Georgian scholars used to refer to this population as Meskhetian Turks. As described in

the aforementioned Author's Note, this study of the population in the Republic of Georgia, researchers utilize the term "Muslim Meskhetian" in recognition of the subject population's experience of displacement and current residence.

Theoretical perspectives of social, ethnic, place and civic identities

Membership in various social, ethnic, or cultural groups influences identity. As scholars (Roccas & Brewer 2002) argued "Identity refers to the outcome of two main processes: self-representations and social categorization. The combination of these two processes results in the feeling of differentiation from others, the recognition of one's own difference, the sense of belonging, and consequent mechanisms of inclusion and exclusion, which are in turn created, maintained, and reinforced through public policies and the law".

Identity is an important aspect of personhood and is the product of social, cultural, political, and ethnic constructions. Of note, ethnic identity is determined by many components, and includes the process of searching, acquisition, and strengthening (Umaña-Taylor, 2011; Phinney, 1096). Ethnic identity is tied directly to belonging to specific ethnic groups. The process of recognition involves both being ascribed that ethnic identity by "others" within the ethnic group, as well as "others" outside of the ethnic group. Ethnic identity is considered to be an inborn feature by some, yet others argue that how people ascribe their own identities also influence identity itself. Two approaches are considered the basis for the emergence of ethnic identity. A primordialist (Isajiw,1993; Smith, 1991) approach claims that ethnic identity is inborn and predefined. Ethnicity is given from birth, assumed to be both solid and permanent. According to a constructive approach, ethnic identity is a choice: what it relies on, what its content is, and the shape it takes is dependent on the free will of an individual. Its basis may be language, religion, culture, race, history, or territory (Simmel, 2011; Barth, 1969). Many psycho-social factors influence the formation of ethnic identity, but perhaps most important is the universal desire of an individual to establish a positive social identity.

Social identity represents an individual's conception of self as defined by social group membership (Turner, Penny, 1986). The specifics of intergroup behavior in the theory of social identity (Tajfel, Turner, 1970) can be explained by the concept of social identity. An individual obtains social identity when the meaning of social group membership is acknowledged and plays an important and positive role in everyday life. Social identity is complex concept; According to scholars (Roccas and Brewer 2002) "the concept of social identity complexity-a new theoretical construct that refers to the nature of the subjective representation of multiple ingroup identities. when individuals may incorporate multiple group memberships in their overall social identity and in their conceptualization of ingroups and outgroups". When person accepted, memberships in multiple ingroups when identity structure is both more inclusive and more complex (Roccas and Brewer 2002).

To describe this type of identity, environmental psychologists use the term "place identity", which is considered part of personal identity and describes people's perception of themselves in relation to specific environmental characteristics (Hernández et al., 2007; Cuba and Hummon 1993a, 1993b).

"Place identity is a complex and dynamic construct, classically defined as an individual's transfer (incorporation) of place into a broader concept of the self; "Memories, concepts, interpretations, ideas, and feelings associated with a particular physical environment (Proshansky, Fabian & Kaminoff, 1983, p. 60).

There are a number of theoretical models related to this construct, and researchers focus on different aspects when defining it, such as a sense of belonging to a place (Dixon et al., 2023), community connection (Sobhaninia et al., 2023; Aton & Lawrence, 2014), interpersonal aspects of identity (Leary & Tangney, 2013), sense of satisfaction with place (Lewicka, 2011) and cognitions formed as a result of psychological connection (Lewicka, 2011). However, each of these models is united by an emphasis on the affective component of place identity - a certain emotional connection of an individual to a place

The existence of diverse definitions of place identity can be considered the main reason why it is difficult to separate it from other central concepts of environmental psychology, such as "place attachment", "sense of place" or "place dependence" (Peng, Strijker, & Wu, 2020). For example, place identity is sometimes considered as one dimension of place attachment (Ujang, N., & Zakariya, 2015). Other authors consider both identity and attachment to be part of a broader construct, sense of place (Jorgensen & Stedman, 2001).

From the perspective of social psychology, place creates the frame of culture and traditions in which identity is constructed, preserved, and transformed (Cuba, Lee, & Hummon, 1993b). Social and environmental psychologists Harold Proshansky, Ebby Fanian, and Robert Kaminoff (Proshansky, Fabian & Kaminoff, 1983) claimed that place identity informs individual social identity, shaped by the experience of daily interaction with physical spaces (Proshansky, 1978).

Places where people live, or lived, acquire different meanings and arouse different feelings and memories. From this point of view, the house is usually one of the most important places, and its change causes changes in the individual's self-identification. When an individual moves from one place to another, their sense of belonging can be threatened (Lewicka, 2011). A person experiences attachment to a place with society, cultural or religious affiliation (Lewicka, 2011).

The move from one geographical location to another can have a positive effect as well as a negative one, especially when this displacement is not voluntary and is related to conditions such as natural disasters, wars, social problems or better educational opportunities (eg, Massey, 2015).

Sometimes it negatively affect a person's psychic condition in the same way the death of a relative, friend, or family member might (Fried,1963).

Thus, the notion of identity is important in the study of forced migration cases, in particular the case of Muslim Meskhetian after tree times of displacement.

The society of Muslim Meskhetians is perhaps of particular uniqueness, in this regard, as their ethnic identity represents the verbalization of a variety of identities: Meskhetian Turks, Turks, Georgians, and Ahiska Turks.

This article studies the Muslim Meskhetians life in the Republic of Georgia. Analysing their identities based of subjective perceptions.

Methodology

This descriptive research study is informed by the general advice of migration scholars who advocate an in-depth examination of the resettlement experience. Firstly, desk research was conducted in order to find out the current features of subject population. After that, the study employed a mixture of both qualitative and quantitative methods. Based on recommendations for selecting the sample size in qualitative research (Creswell, 1998), 60 qualitative in-depth interviews were conducted in sum; 40 out of 60 were carried in participation with Muslim Meskhetians, 10 in-depth interviews were done with experts of this community, and 10 persons who are living in the neighborhood and in local governmental organizations working on the problems of research participants.

According to the information from Ministry of Internally Displaced Persons from the Occupied Territories, Accommodation and Refugees of Georgia nowadays in Georgia are living approximately 423 Individual Muslim Meskhetians.

Respondents for quantitative research were chosen using the nonprobability sampling methods- available sampling. In areas inhabited by participants, was interviewed everyone who met us at home in order to have access to research participants.

The research study included 250 face-to-face quantitative interviews with Muslim Meskhetians living Georgia and a questionnaire featuring two psychological tests:

(1) Twenty Statements Test (TST; Kuhn and McPartland 1954) – used to measure participants' self-identity, the roles played and the priority of these roles

(2) Bogardus Social Distance Scale (Bogardus 1924) - an instrument used to measure participants' willingness to participate in social contacts of varying degrees of closeness with members of diverse social groups, such as those of other races or ethnicities

Both instruments were adapted by scholars (Sumbadze, Kitiashvili, Pirtskhalava, Maisuradze) in Georgia in 2012.

Participants appeared to be quite comfortable while sharing information about their family structure, relationships, and gender roles. The research group consisted of four Georgian researchers, all of whom were non-Muslim Meskhetians. Notably, the ease of establishing communication with the Muslim Meskhetian community depended on the district and household composition, urban vs. rural village environments, familiarity with the researcher from previous research contact, and language barriers. Because the lead researcher was known to participants from two districts (she had conducted participant observation in 2004 with Meskhetians in the Nasakirali and Samtredia districts), research conducted with participants from these specific districts was met with greater ease.

Muslim Meskhetians, who returned to Georgia after the adoption of the 2012 Repatriation Law had difficulty communicating in both Georgian and Russian languages, but assistance from an interpreter mitigated language barriers.

Research results
Muslim Meskhetians in Modern Day in Georgia: Desk Research Results

Muslim Meskhetians, who lived in exile for decades, underwent different repatriation attempts to Georgia over the years. During the first wave of repatriation in the 1970s, they settled in the western part of Georgia, namely in the regions of Samegrelo, Imereti, and Guria. Some repatriates stayed in their homeland and have been living in Samtredia and Ozurgeti villages for more than 40 years. Others live in the capital city of Tbilisi. A small portion returned to the post-soviet Central Asian republic.

In 1999, following a decree from the Council of Europe to return deported people to their homeland, Georgia began working on its repatriation law. On July 11th, 2007, the Parliament of Georgia adopted the law (№ 5261) on the "repatriation of the people exiled from Georgian SSR by former USSR during the '40s of XX century." which was enforced in 2012.

After the adoption of the law, some Muslim Meskhetians did not wait for its enforcement, but entered Georgia and settled in Samtredia and other parts of Akhaltsikhe. Later, after the law's enforcement, Muslim Meskhetians arrived in Georgia by way of repatriation. They obtained Georgian citizenship and some settled in the municipality of Akhaltsikhe and surrounding areas, many of which represent areas from which their ancestors had been deported.

The Muslim Meskhetian community operates as a traditional and closed society, in which individual behavior is determined by historical models that characterize stable social behavior through rules passed from generation to generation. Changes in such a society are slow, as individual behavior is often characterized by a strong adherence to social group norms and influence.

In a Muslim Meskhetian family, traditional male and female roles are defined according to gender. This is due, in part, to the influence of collectivist culture and religion. Muslim Meskhetian culture is characterized by extended family life, homogamy in the creation of families, and the preeminence of parents in the creation of new families. By and large, the community values monogamous families and gender segregation in education. Existing studies have confirmed that Muslim Meskhetians have not assimilated for years in their host countries, including Georgia, where they have lived since the 1970s (Sumbadze, 2007). Due to the compact settlement of Muslim Meskhetians, the process of integration with the local population proved difficult in Georgia and depended largely on the perceptions and attitudes of all members of the community, new arrivals as well as local Georgians (Sumbadze, 2007).

General data of Muslim Meskhetians living in Georgia

The process of locating data about Muslim Meskhetians living in Georgia is challenging. For example, the National Statistics Office of Georgia does not have official data on the number of Muslim Meskhetians living in Georgia. Researchers were able to locate data from "Tolerant,"[4] a non-governmental organization located in Akhaltsikhe. As described in *Tab. N1*, data collected and published by Tolerant in 2012 verifies the number of Muslim Meskhetian families in the Georgian territory.

The 2017 data in *Tab. N1* was compiled with data supplied by Mr. Irakli Kokaia,[5] Head of the Refugee and Repatriation Division of the Ministry of Internally Displaced Persons from the Occupied Territories, Accommodation and Refugees of Georgia.

Tab.N1.

Accommodation of Muslim Meskhetians 2012-2017

Municipality	*Family*	*Total*	*Man*	*Women*		*Family*	*Total*	*Man*	*Women*
	2012					*2017*			
Ianeti, Samtredia	30	163	91	72		36	175	83	92
Nasakirali, Ozurgeti	32	151	76	75		24	117	62	55
Akhaltsikhe	26	123	84	57		60	260	124	136
Cori	12	49	25	24		4	18	8	10
Tbilisi	15	57	35	28		10	40	18	22
Total	115	543	263	282		134	610	295	315

Since 2012 and at the time of this study, 16 families and 56 individuals have arrived in Georgia. According to collected data on the total number of Muslim Meskhetians living in Georgia, 40% of the total population participated in this research study.

General Findings of Qualitative and Quantitative study

The number of quantitative study participants totaled 250 Muslim Meskhetians, 57.4% of whom are female and 42.6% male.

Georgia's Repatriation Law (known as the *Law on the Repatriation of Persons Involuntarily Displaced by the Former USSR from the Georgian USSR in the 1940's*) began its implementation process in 2012. Through the process, the Georgian government facilitated Muslim Meskhetian resettlement.

The country has adjusted the legal framework, as far as the practice is concerned, about 5,000 applicants have applied, more precisely 4,844 adults. Their number with the nation of children was somewhere around 9,000, and in fact from every country where they live, except the United States of America.

Muslim Meskhetians who arrived after implementation of the 2012 Repatriation Law, received Georgian citizenship. Some Muslim Meskhetian families decided to return by themselves prior to the law's implementation and preferred living in southwest Georgia, their ancestral homeland. They bought private houses and land and still reside in those areas today. In contrast, some of Muslim Meskhetians who came by themselves between 2000-2012 have experienced difficulty in obtaining citizenship. The difficulties are related to dual citizenship , some countries of residence of Muslim Meskhetian do not allow dual citizenship with Georgia.

General Findings and Disscusion

Muslim Meskhetian ethnic identity have different opinions about its manifestation according to the schorals (Trier, at all 2007) during the decades.

Over the years Muslim Meskhetians have been referred to in scientific sources as "Meskhetian Turks."

In Georgian historical sources, they are called "Muslim Georgians," or "ethnic Georgians" who lived in Samtskhe-Javakheti, and who experienced occupation by the Ottoman Empire for nearly three centuries (VI-VIII). According to Georgian historical sources, living under occupation influenced their lives, faith, and language (Sumbadze, 2007; Maglakelidze, 1994; Nozadze, 1989).

What is the definition of Georgian identity? Who is a Georgian? For Georgians, religion and language are integral parts of a Georgian identity, and equally important as homeland**.** According to the common opinion in Georgia, this is a person who speaks Georgian and is an Orthodox Christian. (Chxartishvili, ,2008. pp.224 - 225; BogiSvil., at all 2016. pp.70-75) According to identity scholars, „ statement about the foundational elements of nationhood: "land, language and religion/beliefs", is often referred to as the motto of "Georgianness" (Gamsakhurdia., 2020).

Now, Muslim Meskhetians largely consider themselves belonging one of two delineations of ethnic identity: ascribing either Georgian "orientation," and historically recognizing their Georgian origin, or identifying as Turks from Akhaltsikhe „Ahiska Turks ". It should be noted that Akhaltsikhe is the toponymic name of the district in south west of Georgia, which in Georgian is called Akhaltsikhe which is translated as „ New Castle. "

After miltiple turmoil of this society in different time during the senturies , the part of this slociety moved finally to Georgia and are continuing life there. The present rsearch try study Muslim meskhetian identity in their homeland – in Georgia. How they are integrating now in Georgia, How they are filing about their identity and how they are manifesting verbaly about identity now in Georgia.

[4] "Tolenarti" Association of Samtskhe -Javakheti http://asociacia-toleranti.blogspot.com/

[5] Irakli kokaia. Head of the Refugee and Repatriation division, Ministry of Internally Displaced Persons from the Occupied Territories, Accommodation and Refugees of Georgia; http://mra.gov.ge/eng/static/661

For Muslim Mekhsetians living in Georgia means integrate in this social invornamet. How we will caled this process - integration or re-integration depends on how they try to establish themselves and realize their identity in the environment**.**

According to *MC. La Barbera (ed. (2015)* "Identity encompasses the multiple roles endorsed by individuals in social life that are externalized through the use of markers, such as language, dress, and occupation of space. Drawing on social psychology, sociology, anthropology, political sciences, and feminist studies, the concept of identity that grounds this volume is a complex social phenomenon resulting from constant negotiations among personal conditions, social relationships, and institutional frameworks."

The process of integration depends on the language competence of individuals in the national language of the country in which a person lives. This language competence depends not only on secondary education in that language, but also on the language people use to communicate with at home. In case of Muslim Meskhsetians, National language competence continues to be a challenge for Muslim Meskhetians in Georgia. When asked which language they use at home, the majority of participants indicated that they speak Turkish Anatolian Dialect at home. Only a few families speak in Georgian with their family members. In summary, 89% of participants use the Anatolian dialect of the Turkish language at home. Fewer than 9% say that they speak Georgian at home. Even fewer use Russian as a colloquial language.

The colloquial language spoken at home is an indicator of ethnic identity for many cultures. For the majority of Muslim Meskhetians research participants, answering questions about both identity and language was met with some discomfort. Formerly, the only segment of the population who could speak in Georgian were young schoolchildren (Sumbadze 2007; pp214), but today many more people, including elders, speak Georgian.

*"Now more of our people are speaking the Georgian language. We studied Georgian language in high school. Our children begin speaking the language in kindergarten and use it every day throughout school. Our parents now speak Georgian instead of Russian. When they arrived, they did not speak the language, but today it is different." (*37-year-old male in Georgia)

As Sumbadze (2007) argues, the ethnic identity of Muslim Meskhetians is different and has changed over time. Those residing in Georgia most commonly claim their ancestors as Georgian, while others identify with other ethnic groups (pp. 227-228).

Muslim Meskhetian ethnic identity is heavily influenced by displacement itself:

"Some of them call us Tatars, some of them call us Turks. Sometimes we are identified by place of residence--Azerbaijan Turks, Uzbekistan Turks, Turkmenistan Turks--because of language." (68-year-old female in Georgia via Sumbadze 2007 pp.228)

"*I am a Turk. I was born in Uzbekistan, live in Krasnodar, and my homeland is Georgia. But I am a US citizen. I do not have a homeland in my view. Can you tell me where my homeland is? I can't."* (39 - year -old male in the United States (Pirtskhalava 2018. pp.8)

Sometimes identity is ascribed strategically as a method of accessing resources (Sumbadze 2007 pp. 228). With such disputes over identity itself, Muslim Meskhetians may identify as Georgian when accessing Georgian resources or community and Turkish when accessing Turkish resources or community as a means of gaining support, connection, or legibility.

To determine ethnic identity, participants were asked questions about how they identify themselves. The possible descriptions included "Ahiska Turk" (Turk from Akhaltsikhe), "Georgian," or "Turk." More than half of the participants identified themselves as Ahiska Turks (57.9%). This ethnic group dislikes being referred to as Meskhetian Turks and some of them (mostly those living in other countries) consider being referred to as Georgian incorrect.

"We are Turks but not from Turkey, we are from Ahiska, and we are "Ahiska Turk"- (50 years old-Male)

According to my previous study in the USA (Pirtskhalava2018) 62-years - old - Muslim Meskhetian woman who is living in Pennsylvania state US, did not know what is the meaning of "Ahiska" but she defines themselves identity like this. Muslim Meskhetians who are living in Georgia, have been in Akhaltsikhe and in the villages around of this at least once. They were living in different villages in Akhaltsikhe district, but they are putting in the label of identity (place) main town of those district.

What is the marker being of "Ahiska Turk" for Muslim Meskhetians?

Discussing about of this maker of identity for the deported people as a community, have a history of Muslimization in the 16-17th century, during Ottoman occupation, of multiple forced migration and displacement experiences, analyzing the difficulty of combining different understanding nationality and identity. In on the one hand, being a Georgian and on the other hand, being Turkish.

According to Gregory Goalwin (2018) "For residents of the former Ottoman Empire, religion became synonymous with national identity, and all those who fell outside the boundaries of the religious ingroup simultaneously faced exclusion from the national community". For Yusuf Akçura the relationship between religion and nationalism in the Muslim world is "One of the fundamental tenets of Islam is expressed in the saying 'religion and nation are one'" (1981). Taking these considerations into account, living under Ottoman occupation during 2 century's (1578 – 1878) had influence of identity perception.

The conceptualization of the Georgian nation with the reinterpretation of the main ethnic markers Georgian is a person who was born in Georgia, speaks in Georgian language and is an Orthodox Christian. "Ilia Chavchavadze's statement about the foundational elements of nationhood: "Land, Language and Religion/beliefs", is often referred to as the motto of "Georgianness" argues Gamsakhurdia (2020). Nowadays among the Muslim Meskhetians only small group

speaks in Georgian (according most of respondents narratives their grandparents spoked fluently), all of them are Muslims and this is how they differ from the majority of Georgians in Georgia, but It should be noted that, the Muslim Georgians are living in Georgia, in Achara district - in the neighboring area of Meskhet- Javakheti, from where are Muslim Meskhetians, and this part of Georgia was under Ottoman occupation, but during 1614- 1878 They lost their Christianity but kept Georgian language. Muslim Meskhetians lost both of them, and finally by decision Soviet government lost land (deported from the homeland).

It can be assumed that one of the reasons for Muslim Meskhetian being the "Ahiska Turk" and not a Georgian or a Turk from Turkey is different meaning of ethnicity or nationality from point of view of Turks and of Georgians.

In the other hands from my point of view the "Ahiska Turks" identity is fraught with the psychological trauma of multiple displacement accompanied difficult conditions.

The deportation of Muslim Meskhetians from Georgia came with little explanation and the community is still grappling with the emotional scars of deportation and the historical legacies of forced displacement and subsequent trauma.

As Aydin (2017) describes, "psychological trauma is a type of damage that violates the familiar ideas and expectations about the world of an individual or society, plunging them into a state of extreme confusion and uncertainty. War or other types of mass violence (genocide, deportation) often cause trauma that, besides individuals, involves a society or a culture" (Bessel & Van Der Kolk, 1987, pp. 1–30).

The traumatic event, as deportation, which is shared by a group of people scholars refer with few existing concepts of "collective trauma" (Hirschberger 2018) "chosen trauma" (Volkan 2001)' "cultural trauma" (Alexander 2004) "Psychological trauma and cultural trauma" (Smelser 2004) or "societal/social trauma" (Suedfel 1997).

Accordin af scholars (Muldoon at all (2009,2013.,2019)work the political situation has a numbing effect on the identity, the trauma which is the result of the life experience, has an impact on the identity, and according to it can be explained that the new group created by the internal homogeneity of the group - Ahikha Turks, for the part of which lives in Georgia, Georgianness is more a social identity, than an ethnic one.

The obtained results of this research are an indicator of this.

Because of unity with that group is represented in this way, even though the Muslim Meskhetians who are of the "Georgian orientation" put Georgianness first, still Turkishness is an important aspect of their unity with a homogeneous group, which not only unites the residents of Georgia but everyone who was deported from Georgia as a result of political persecution.

The history of displacement this population gives reason to think about traumatization. The deportation from homeland (1944) as "undesirable peoples", was deported from the Caucasus to the Central Asia (Kyrgyzstan, Kazakhstan and Uzbekistan), the other displacement because of conflict with indigenous group (local Central Asian population) (1989) after relocation one part of population moved to Azerbaijan, the other part to Krasnodarsky district of Russia, the later repatriation to homeland but not to the place of origin.

Many still ask "what have we done/we done to deserve this?"

It can be argued that identifying themselves as Ahitkha Turks could be both a psychological defense mechanism in response to trauma and directly linked to the phenomenon of "place identity" (Cuba and Hummon 1993a, 1993b). It should be noted that the participants of the qualitative research (who were the same participants involved in the quantitative research) mostly referred to themselves in qualitative interviews as Georgian.

"Why do you always ask this? We are Georgians and we returned to Georgia and have lived in Georgia. For so many years, we were living in a different place. We speak Russian very well and our "Meskhetians[6]." After returning to our homeland, we've been learning Georgian and our children and grandchildren speak the language very well." (67-year-old male in Georgia)

"Why do all the researchers who study us after coming back to Georgia ask the same question, 'how do we identify ourselves?' I say to them and you, again and again, we are Georgians, Meskhs, but we speak Turkish. We call it Meskhetian's language.[7]" (60-year-old male in Georgia)

"Some of our people don't know our history very well, because they have made mistakes. We know better, our grandparents tell us about our origin and history. The Soviet government had an impact on our people's minds, but we know exactly who we are." (29-year-old male)

Muslim Meskhetians in Akhaltsikhe repatriated earlier than those living in the western part of Georgia, and their adaptation process is currently underway. Most Muslim Meskhetians arrived after 2008 and 2012, but some have been living in Georgia since 1980. Data analysis suggests that religious identity saliency for newcomers is underscored by living in a new social environment where the majority are Orthodox Christians. Yet, for residents who are more adapted and integrated, civic identity is more salient.

"Twenty Statements" Test is used to investigate self-identities, as well as roles and role priorities. The participants answer up to twenty responses to the prompts, "Who am I?" or "I am..." According to authors Kuhn (1960), the twenty statements test should be

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[6] The participant is referring to Anatolian dialects of Turkish.
[7] According to Muslim Mekhetians "Meskhetian language" here refers to Kartvelian languages. In the Republic of Georgia Georgian language is State Language but there are two another Kartvelian languages which don't have script: Megre-

lian(spoken by Georgian population living in Samegrelo- region of Georgia) and Svan (spoken by Georgian population living in Svaneti -Region of Georgia) which comes from the names of the regions where this region is located, Samegrelo and Svaneti).

grouped into five categories: Social groups and classifications; Ideological beliefs; Interests; Ambition; and Self-evaluations. This research study employs the "Twenty Statements" Test as a methodology to unearth how research subjects formulate their identities.

The Social identity complexity theory underlines the ways in which the various group identities interact, seeking to understand how individuals construct social identities in relation to multiple nonconvergent ingroup memberships (Roccas and Brewer 2002).

According to the Twenty statement test, most of the Muslim Meskhetians primarily identify themselves with the social roles they have. In second place is identifying oneself with the Muslim religion, meaning that religious belief is one of the main components of the identity, for 18,6% is important in their identity Meskhetians as group identity, only 9.3 % of participants say that they are Georgians, 5.5 % Georgian citizens, and only 1.1% say that they are Georgian Meskhetians. Only one of the participants in the survey claimed Meskhetian Turk identity.

The data generated from the "Twenty Statements" Test forms an order based on designated importance. As the test adaptation in Georgia has shown, people often name the following categories: *professional identity, family role, status, gender, and age*. Among the identities named by Muslim Meskhetian participants, the family role holds an important position. Religion is also highlighted, which takes second place in most cases and is given greater significance than ethnic or civic identity.

Through analyzing data gathered from the Bogardus Social Distance Scale and qualitative interviews, it can be said that the most salient identity (Encyclopedia of Identity 2010) for Muslim Meskhetians is their religious identity. **Social distance** is an important measure to find out how open people are to becoming close to people who are ethnically or socially different from themselves. The Bogardus Social Distance Scale (1924) is used as a scale that measures varying degrees of closeness in people towards other members of diverse social, ethnic and racial groups. Measuring social distance can show how people are integrated into the social environment.

According to the data, the majority of relationships and contact are with those who share their religious identity. In this way, marriages and starting families is most approved of by family members if marriage partners are both Muslim Meskhetians. If not Muslim Meskhetian, approval is secondarily given to marriage arrangements between a Muslim Meskhetian and an Orthodox Christian Georgian, followed by marriage to someone who is Azerbaijanian, Turk, or Adjarian (Muslim Georgian). The positioning of marriage to Orthodox Christian Georgians as secondary to Muslim Meskhetian marriages contradicts researchers' observations that there are few, if any, marriages with non-Muslim Meskhetians, and in the handful of instances, more inter-ethnic Muslim Meskhetian marriages with other Muslims than inter-ethnic marriages with Orthodox Christian Georgians.

On this scale we put a diversity of ethnic identities of those who live in Georgia, including Adjarians (eco migrants from Adjara[8] living in Guria), who are ethnically Georgian and religiously Sunni Muslims. Some Adjarians reside alongside Muslim Mekhsetians in the Ozurgeti districts (specifically Guria) where repatriated Muslim Meskhetians had taken up residence in the 1980s. In recognition of the importance of Muslim Meskhetian religious identity, we divided Georgians according to religion to encourage a deeper understanding of social distance.

On the Bogardus Social Distance Scale, the participants' desire to have close contact with representatives of the same group (other Muslim Meskhetians) is highest. Relationships with Orthodox Christian Georgians take second place for them, followed by those with Azerbaijanian, Turk, and Muslim Adjarian populations. The participants showed the least interest in having close contact with the Kurdish and Roma people ethnic groups (both national minorities who live in Georgia). Based on these results, we can say *that ethnic identity determines their contact proximity more than their religious identity.*

According to the data of the Bogardus Social Distance Scale, Muslim Meskhetians would most readily consent to establish a family or would approve of the marriage of a family member if the partner were Muslim Meskhetian; followed by Orthodox Christian Georgian. Yet, participant observation does not reflect this claim, as there is only a small percentage of marriages and families made with Orthodox Georgians, while in contrast, Adjarians, who are Muslim Georgians and share the Sunni Muslim religion with Muslim Meskhetians, are marrying at higher rates than inter-ethnic Orthodox Georgians when residing in the same villages. In other words, marrying within the religion seems preferable.

When it comes to friendship, the data shows that younger generations have more Georgian friends than older generations. Evidence suggests that attitudes depend heavily on exposure and access to relationships with people of different ethnic groups. The younger generation of Muslim Meskhetians born in Georgia have more openness and are likely to have Georgian friends in high school, Georgian neighbors, and daily interactions that give way to regular communication and access to relationship-building. Muslim Meskhetians have relatives in Azerbaijan and visit to attend a wedding or funeral. Other Muslim Meskhetians visit Turkey as seasonal migrant laborers. One can anticipate that the low rates of willingness to have contact with Roma people may be simply because the majority of Muslim Meskhetians never have interacted with the roma people population.

Notably, participants emphasize the impact that the return to Georgia has had on their lives:

"I am very happy my parents decided to live in Georgia. When I visit relatives in Azerbaijan and come back home, I always say thank you to my grandfather and my parents because women live so much freer here, compared to where my relatives live abroad. There is a

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[8] AdJara, Guria, Samegrelo, Svaneti, Mekheti are regions of Georgia

normal life here and good people. I can be educated. I can dress however I want. I still get my parent's permission, but I can go where I want to go." (17-year-old female in Georgia)

The tradition of establishing a Muslim Meskhetian family is largely uninfluenced by integration. By and large, it is still the case that Muslim Meskhetians create families only with other Muslim Meskhetians. It is a rarity to see Muslim Meskhetians marrying "non-Meskhetians." According to the data, religion plays a leading role in such cases. In Samtredia and Osurgeti there are small cases where families have Adjarian daughters-in-law. The tradition of marrying Meskhetians with Meskhetians was also maintained during displacement (Sumbadze 2007).

Concerning differences between the gender of participants, this data shows that females consider marriage with an Orthodox Christian Georgian more acceptable than males. The difference between the genders on the acceptability of marriage between a relative with an Azerbaijanian is even higher, with more females approving of this marriage arrangement than males. Meanwhile, a relative getting married to an Adjarian is more acceptable for males than females. The answer of the question *I would give consent if my relative got married with – 98.7%of female and 98,1 Male respondents first answer was Meskhetians, the second Georgian(43.4 and 39), Than Aseri(42,1; 32,7) and Turks(32,9 32,4)*

Summury

Muslim Meskhetians living in Georgia have largely preserved the cultural and social practices that had been important to them before, during, and after deportation. When it comes to the question of what has changed for Muslim Meskhetians as a result of integration and adaptation, the answer is both a detailing of what is transforming and what endures. While Muslim Meskhetians continue to preserve and prioritize intragroup relationships and religious community ties, the community is also increasingly speaking in the state language (Georgian), forming community with the broader Georgian population, and claiming Georgian citizenship and a sense of belonging and integration in Georgian society.

While the results of the research show, that for the majority of Muslim Meskhetians, religious identity continues to be more salient than civic identity. When it comes to relationships, this study has shown, that while Muslim Meskhetians still largely marry within their community, they are slowly becoming more integrated with the rest of Georgian society. They are forming friendships with people from other ethnic groups, and the younger generation is growing up with significant language acquisition and cultural influence from the broader Georgian population. As the younger generation continues to age, one can anticipate greater integration into Georgian society through shared language, community, and participation.

Identifying as Ahiska Turks for Muslim Meskhetians can be viewed as a direct response to the psychological trauma of decades marked by forced removal, displacement, and the long repatriation process. That is,

place – in this case, Ahitska (Akhaltsikhe)–became positioned at the core of emotional attachment for Muslim Meskhetians (Cuba and Hummon 1993a, 1993b; Giuliani 2003; Hernández et al. 2007). Therefore, reclaiming Akhaltsikhe can be viewed as both a trauma response (Aydin 2017) and defense mechanism in addition to providing a pathway of return for the displaced. Muslim Meskhetians are engaged in the construction of what is referred to as "imagined community" (Andersson 1991) by collectively imagining an Ahiska Turk identity, an identity that allows them to re-envision their religion as historically Muslim (Pirtskhgalava 2018) and deeply connected to home.

This can be seen in the framework of two theories, the common ingroup identity (CIIM; Gaertner and Dovidio's (2000) and the ingroup projection (IPM; Mummendey & Wenzel, 1999) model. The collective trauma caused by the political situation, the cause of which has not been explained to them, led to ethnic separation from the main group and identification with another larger group based on religious indicators.

The identification with the common groop "Ahitska Turks", in which all deportee's population from Meskhetia are united, which is tied to the place and forms the identity of the place (mein town of Meskhetia - Akhaltsiche) instead of the national identity, the non-acceptance of Georgianness (be Georgian) may be due to group attitudes. In the variant of intragroup presentation, „Turkishness "- (be Turks), as well as membership of a social group, is presented as part of a large powerful group, but again not in ethnicity.

In my opinion, the place identity is the solution to overcome this ambivalence for Muslim Mekhetian.

The integration (Berry 1997) process for Muslim Meskhetians is marked by both the maintenance of original culture and the adoption of key aspects of the comunities. Integration is both an ongoing process and a reciprocal process, in which receiving societies adapt to new immigrant populations, and knowing the language, participating in education and communication with local inhabitants play important roles in integrating communities (Gordon, M.1964; Berry, J.1997; Augoustinos & Innes, 1990; Moscovici, 1981; Hooward, 2000). The integration process is not facilitated by simply living in the territory. As research shows, language acquisition plays a major role in the process. In this case, Georgian language acquisition is an essential catalyst for communication and access to education, another critical part of integration. As education gives way to deeper civic identity formation, more robust connections with the local community, and increased access to resources, more integration follows.

In summary, the story of Muslim Meskhetians reflects both significant cultural preservation and the slow impact of integration and cultural adaptation. As time goes on, the data indicates increased integration is on the horizon.

Future Directions for Research

Future research in the form of longitudinal studies can work to trace these changes over time, including the distinct ways in which preservation and integration may influence one another. Moreover, future directions for research can include a deeper exploration of

whether and how rescripting displaced identity via the "place identity" (in this case the Ahiska Turk identity) may function to redress trauma and reclaim territory and religious identity. Moreover, longitudinal studies exploring how younger Muslim Meskhetians navigate both their history and future will lay the groundwork for understanding how this population grapples with reclaiming place and belonging in the aftermath of displacement.

Limitation of Research

One primary research limitation of this study is that the researchers were non-Muslim Georgians and therefore occupy a different positionality in relation to integration itself. Despite that fieldwork was conducted with the help of an interpreter, researchers also believe that not being able to communicate in Turkish languages impacted qualitative interviewing with Muslim Meskhetians who arrived after 2012 and are less likely to speak Georgian.

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TECHNICAL SCIENCES

MODELLING PROPOSED SDN PARALLEL TOPOLOGY AND EVALUATION OF ITS RELIABILITY

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Abstract
This paper presents a solution for enhancing the defense level of the software-defined network (SDN) structure, by proposing another topology for SDN controllers called the parallel topology. In this topology, the controllers interact in a parallel way with each other and work as a single controller like one brain. This solution could be a way to enhance the reliability of the SDN environment to defend against some cyber threats mostly DoS/DDoS threats. This paper depicts the modeling of this topology using the Petri Nets system and then compares it with the modeling of the Ordinary topology, which is the already existing topology that has merely a single controlling point.

Keywords: East-westbound API, Generalized Stochastic Petri Nets, hydra, Ordinary topology, Parallel topology, RSA, virtual private network.

1. Introduction

Previously we have described the software-defined network structure and how it works [1 - 3]. It mainly comprises new way of managing the computer network to facilitate network management. This is done by extracting the control ability from the network devices, rendering them merely packets forwarding devices. While the control will be a dedicated virtual plane represented by the controller that can be of a software or a hardware nature, and labeled as the control plane. Meanwhile the switches which became merely packets forwarding devices will be labeled as the forwarding plane or layer. The ability to develop applications that will manage the control plane will lead to the emergence of the application layer, those applications will be designed as per the needs of the enterprise or system administrator.

All the above will facilitate the network management by creating a single point of management and policy enforcement over the whole network's structure and that is one of the advantages of the software-defined networks.

But, despite that this feature which is the single point of management; is a strength point in the structure of SDN it could be a vulnerability as well since it could be used as a Single Point Of Failure weakness point or in short (SPOF), in order to solve that, some SDN environments could use multiple controllers. In our research, we use multiple controllers in different ways and those ways or topologies differ from each other in the way their SDN controllers interact between each other.

There have been three main SDN controllers' *topologies* proposed to patch the aforementioned issues, those topologies could use multiple controllers to assure the security of SDN and overcome the (SPOF) issue and they are:

- Serial topology: which we have discussed in an earlier article [4].

- Parallel topology: which will be discussed in this article.

- Hybrid topology: which consists of 6 controllers working together and combining the features of both the previous topologies [5].

Alongside with those proposed topologies, there will be a suite of suggested algorithms that will work as a framework on top of the controllers in the aforementioned topologies. These algorithms are:

1.1. The hydra framework Hydra is the result of the later mentioned algorithms added to them some counter measurements against some cyber-attacks like the DoS/DDoS [6]. An example of these measurements could be installing botnets [7] within the network nodes to deter any kind of DoS/DDoS [8] attack by attacking the attacker's IP address. The composition of these methodologies and others would give the SDN controllers' topology flexibility and ability to behave like the hydra microscopic creature; if you cut one head another one grows, the same thing here with those algorithms to secure the controllers and the connection between them, that will make the topologies more capable of handling threats and in case of an attack on one of the controllers another one will be elected as the main one like in serial or hybrid topology or the controllers will deal with the attacker and continue managing the network to bridge the gap in case of the parallel topology.

1.2. VPN is an abbreviation for (Virtual Private Network), the VPN can be leveraged to secure the channel of connection or the east-westbound API [9] between the multiple controllers and that by leveraging the internet protocol security (IPsec) technique that is included in VPN. The VPN technologies can provide certainty of sensitive data confidentiality to be kept transmitted on the network so that only authorized users are able to access sensitive data [10]. Two controllers could be connected together by leveraging the VPN's channel regardless of their location and proximity, and they could securely exchange the information and that

provides better security against cyber-attacks; man in the middle (MITM) attack is considered as an example of those cyber-attacks [11]

1.3.Double RSA the algorithm of RSA stands for Rivest–Shamir–Adleman (RSA) which are the initials of family names of its inventors. RSA is a well-established public-key crypto algorithm. It is in use for securing data transmission on a wide range. This encryption methodology comprises mainly a public key for encryption which has to be different from the key used for decryption which will be secretly kept (private). It is worth mentioning that Clifford Cocks, which was an English mathematician who worked for the British intelligence agency Government Communications Headquarters (GCHQ), was responsible for developing a system in 1973, and that was not declassified until 1997. Public Key Cryptography (PKC) works on the concept of dual keys [12]. The RSA encryption shall be used here as well. The implantation of this algorithm in the proposed framework will be differently conducted. The including will be done by starting two channels meaning, there will be a double ciphering channel. In other words, rather than using one public encryption key and two different private keys in each ciphering and deciphering operation; two distinct keys that are public will be leveraged with other four different keys that will be considered private keys. Each communication node will have its own set of keys that will help in starting a channel of secure communication for sending data and another channel of communication for receiving data.

1.4.Blockchain is one of the most soaring up technologies nowadays due to one of its main participations, which is the cryptocurrency technology. This technology is also merged with the Hydra framework but in another way than the way used in cryptocurrency. It is also used in some other fields like in networks but in a different way like in the Marconi protocol [13]. Blockchain here will be used in another way to develop a secure channel for exchanging configuration updates between controllers.

2. Materials used

This article talks about a proposed topology to enhance the security of software-defined networks, which is the parallel topology. This topology is going to be modelled and to get results; a software tool was used. This tool is called PIPE which is based on Markov chain and implements petri nets system and using the generalized stochastic petri nets (GSPN) in it to figure out the durability and feasibility of the topology and whether it's better than the other previously suggested topologies or not. Then this paper compares the Parallel topology with the Ordinary topology. GSPN is a module of six tuples (P, T, F, W, M_0, and λ) where:

- P= {P_1, P_2… P_m} represents a set of finite nature of places, where n ≥ 0.
- T= $T_1 \cup T_2$, T1= {t_1, t_2… t_m} represents a set of finite nature of timed transitions, and every transition is correlated with a random time of delay between the functions of enabling and firing. Also, T2= {t_{m+1}, t_{m+2}… t_n} represents the set of immediate transitions of a finite nature. It is possible to fire these transitions randomly. In addition, the delay time will be zero.

- While F can be described mathematically as F⊆ (PxT) ∩ (TxP), which is an arc set.
- W refers to the weight arcs operation, so: F à {1, 2, 3…}.
- In addition, M0: P à {0, 1, 2, 3 …} represents the initial marking, that can be described as (PxT) = Ø ∩ (TxP) = Ø.
- Last but not least, λ= {λ_1, λ_2, λ_3 … λ_n} describes firing rates group or category referring to timed transitions. Where every single rate represents the transition's average firing times per unit of time [14].

2.1.Parallel topology

This article concentrates on the parallel topology and compare it with the ordinary topology, which is an already existing topology that encompasses mainly one controller representing the control plane of the whole structure. In the Parallel topology, there will be three controllers working and interacting together as a completely one entity integrated together where the info is processed synchronously. Each controller will deal with any area or segment of the network especially, if it was closer to this slice or segment than other controllers were. Meaning that, each controller will give higher priority to closer network segments than the further or more distant segments (of course the distance will be calculated based on the number of hops in the path between the network slice and the controller), of course the updates will be also every 10 seconds. We call this topology as the parallel topology since all controllers work together in parallel so, there is no priority numbers here because they all behave like parts of one main controller where each one of its nodes will serve the closest switches to it first so, the priority for a switch in France to be served by a controller in France will be higher than that of a switch in Russia based on the number of hops between the switch and the controller. As shown in the figure 1.

Which means that, if we have three controllers connected in a parallel topology and they're distributed in France, Moldova and Russia respectively then; the part or node of the that big main controller that lies in Moldova will serve the switches lying in Moldova for speed reasons. The other switches lying in Russia and France will be served by the controllers of their own countries. In case if the controllers of their countries were busy and the Moldovan node was free then, it will automatically serve the Russian and French switches because all controllers are integrated with each other in a parallel way so, they behave as one distributed controller over those countries. Despite that the controllers here work simultaneously like one and share the same database of configuration but, the updates will be also every 10 seconds but they will be mere acknowledgements.

In some cyber-threat situations like DoS/DDoS attack situation, it is possible to have working controllers fill the place of the infected controller and try to deal with the coming flooding requests and here we will have one of two cases:

- The infected controller will be isolated using access control lists or any other technology. And others

will keep working like before like one controlling entity containing the rest of controllers.

- On the other hand, the two other controllers will try to ease the pressure off of the infected controller by taking a huge load of the requests coming from the attacking source to prevent the attacked controller from being down completely. Until the attack source gets blocked and counter attacked; or if that fails and the other 2 controllers behave slowly or respond too late then, they will attack the attacking source with a counter DoS/DDoS attack and then they'll block both the attacker's IP and the infected controller's as well and we'll go back to step 1.
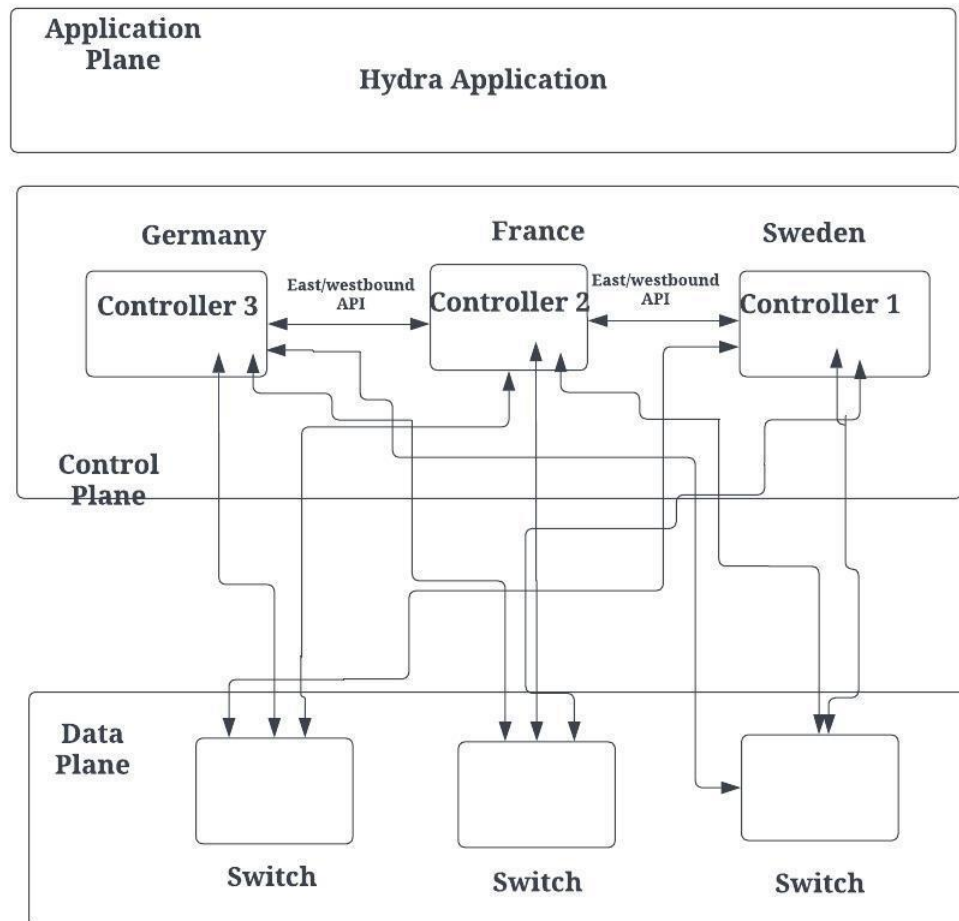
Figure 1. Structure of the Parallel Topology.

2.2. Ordinary topology

Which is a simple topology representing software-defined networks. This topology contains a one controlling point responsible for managing the entire network's topology. It manages the switches through the openflow protocol. The switches in return deal with the clients' requests.

The controller could stop if it was submerged with many pseudo requests when conducting cyber- attacks like DoS/DDoS attacks. If there's no substitute for the controller, the whole network could be in danger in case the controller was disrupted or if the switches got hacked via the single controlling point. The figure 2 depicts single-controller SDN structure or as it's called here, the Ordinary topology.
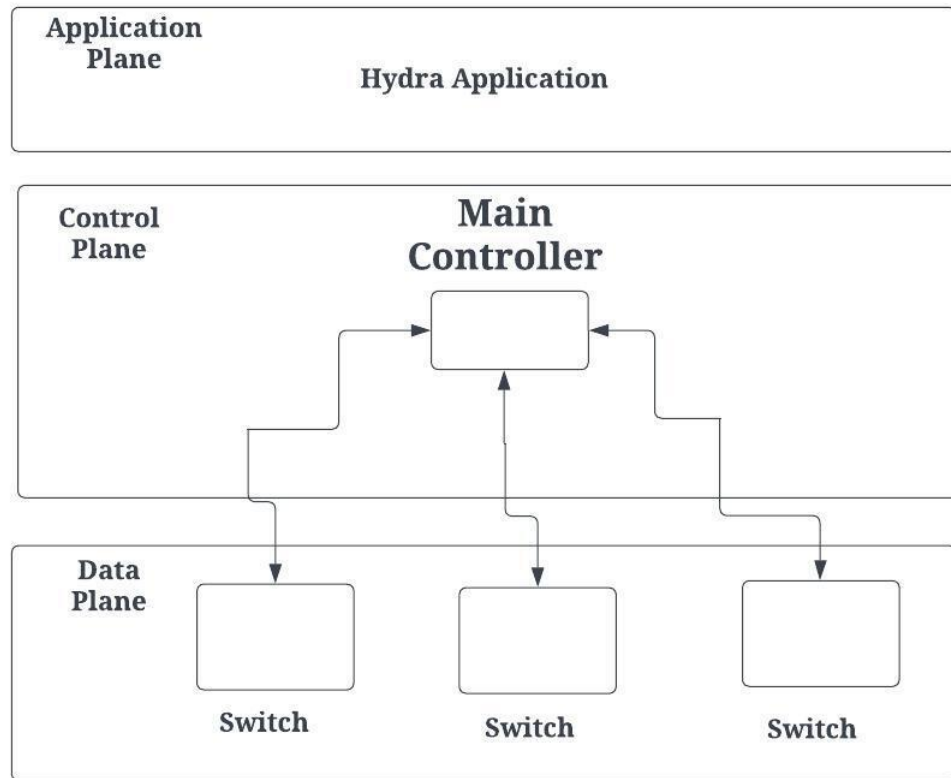
Figure 2. Structure of the Ordinary Topology.

2.3. Modelling using Petri Nets system

Petri networks were developed for depicting chemical processes. Petri nets methodology offers a notation on a graphical basis for step-based procedural systems like concurrent execution systems and iteration procedures. This technique has a mathematical description. The theoretic aspect of Petri nets allows precise modeling and analysis of system behavior [15]. This paper depicts the usage of petri nets to model the Parallel SDN controllers' topology to acquire an improved limitations comprehension of the topology, its capabilities, and also to extrapolate a mathematical definition

or an equation from its model's behavior. That equation can be used later for assessment of network's security risk mathematically.

3.   Parallel controller modeling
3.1. Parallel Topology

The Parallel structure of network contains three main controllers that work together simultaneously as one entity like one brain. Those controllers send updates to each other of network configuration information about network nodes. The figure 3 shows the modelling of the parallel topology's structure using Petri Nets methodology.
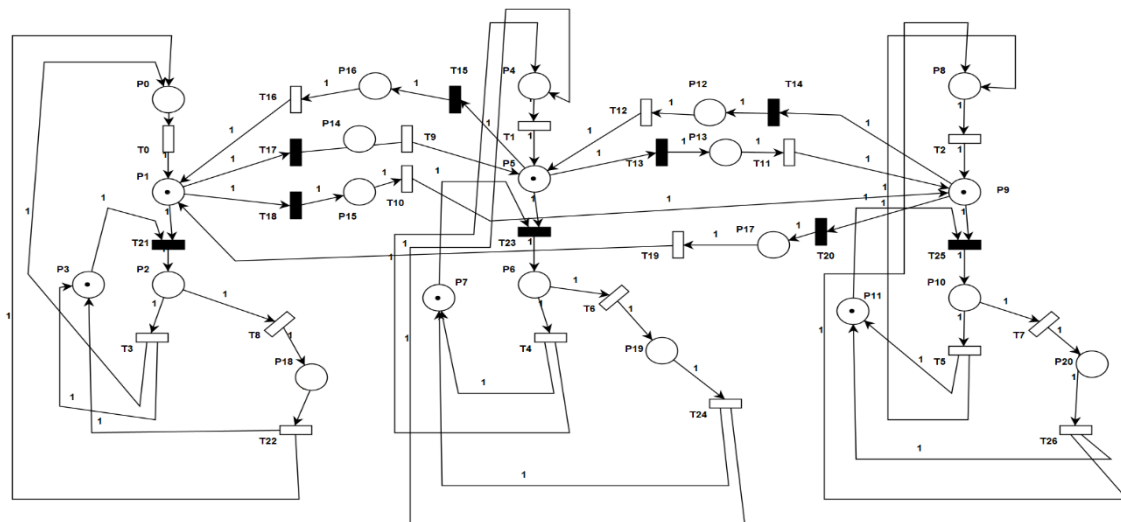
Figure 3. Modeling of Parallel topology via GSPN module.

Parallel topology's scheme Explanation:
- Just like the Serial topology, the parallel topology will have three main controllers. Those proposed topologies differ between each other in the interactive behavior of their controlling nodes.
- Those three main controllers will interact with each other forming a whole controlling entity like one brain of three nodes. Those controlling points work simultaneously to deal with switches' requests.
- The controllers will work and collaborate in managing the network topology like one main controller.
- Every controller is going to serve network switches based on priority that will be determined based on the closest switches to it. The closest switches will be determined based on the number of hops.
- Every controller will exchange the configuration updates with the other remaining servers/controllers through a broadcast update every 10 seconds as well.

- Every 10 seconds the information of network configuration will be gathered meaning; every 10 seconds the three controlling nodes have the ability to update their network's general table status. The justification for that is that the three nodes; which form one triple-node controlling brain is going to exchange the info among each other every 10 seconds.
- If any of the controlling nodes is under attack, the remaining two controlling nodes will compensate for the absence of the infected node.
- All the network switches are already in connection with the three controllers. In case if there was a threat then, the framework will activate a bot and send it to the perpetrator's address. Then the jeopardized controlling node is going to be insulated; alongside the perpetrator. All forwarding data plane nodes, which are being served by the infected controller; will be served instantly by the other controllers. Table 1 describes the places.

Table 1

Places Description

Place	Description
P5/P9/P1	Allocating the servers
P2/P10/P6	Active processing in the 1st, $2^{nd \ and \ 3rd}$ servers
P12-P17	Exchanging info between network controllers
P3/P7/P11	Controller restoring
P19/P20/P18	Attack on Controller/ Server
P8/ P0/P4	Moving back to first working status of the network before the attack

The table 2 below states the description of transitions.

Table 2

Transitions Description

Transition	Description
T21/T23/T25	Server No.1,2 and 3 represent processing of requests
T9-T20	Servers Exchange configuration updates between each other
/T5/ T3/T4	Going back to the processing situation
T8/T6/T7/	State of attack on the server or controller
T22/ T26/T24/	Restoration of controller
T2/ T0/T1/	Returning to the original working status

3.2. Ordinary Topology

From figure 4, it is possible to notice that this modelling depicts the single-controller ordinary topology and shows its vulnerabilities.

Ordinary topology's scheme Explanation:
- The modelling of this topology depicts the already-existing, known model that leverages a single controlling node.
- The modelling of this topology was needed for the purpose of comparison to depict the effectiveness difference between the proposed topology and this topology.

- This scheme clarifies how a single controller can be vulnerable and ineffective against attacks due to the existence of (SPOF) which requires patching.
- The model here contains one controller to manage the whole network in a normal way until an attack takes place.
- If an attack occurs, the previous design proves that an attack is capable of disrupting the controller and every node connected to it. Therefore, the network model will be in danger in case of a successful attack on the controller, which states that the fault tolerance of this topology is zero.
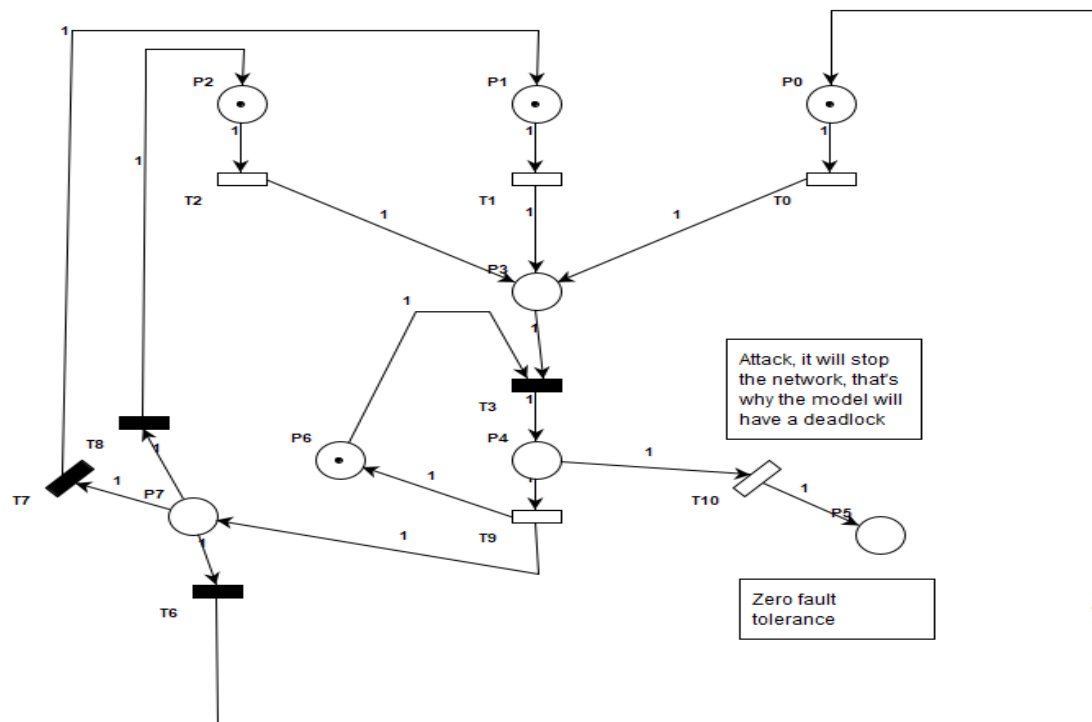
Figure 4. Modelling of Ordinary topology via GSPN module.

Table number 3 explains places of the scheme.

Table 3

Places Explanation

Place	Explanation
P1/P2/P0	Selecting process of switches
P3	Represents the key controlling
P4	Active state of requests processing
P6	Dealing with the new update / returning to original status
P7	Exchanging configuration updates
P5	Status of cyber-threat on the controlling node

Transitions are shown in table 4.

Table 4

Transitions Explanation

Transition	Explanation
T1/ T0/T2	Controlling node receiving requests
T3	Active state of requests processing
T9	Status of treating requests
T8/T6/T7	Managing switches and dealing with them
T10	Cyber-threat state

3.3. Equation of Defense Factor (DF)

- **PIPE software's module of GSPN**

Now by comparing the two topologies based on the density of tokens in places that depict the controlling nodes in the SDN structure. In those places; tokens simulate the tasks performed and broadcasted every 10 seconds by the controllers, and of course the less busy the controller is; the better; due to the fact that it proves that SDN structure has a higher capability of deterring cyber-attacks especially DoS/DDoS. This comparison comprises value ω, which is the immediate transitions' weight which was left as default. Value (r) stands for timed transitions rate that was set to value of 0.1 because it is needed to broadcast those network updates/ configurations every 10 seconds; meaning that the state of the model will change every 10 seconds. It is possible to see the connection between rate and weight values:

$$\tau = 1/r \qquad (1)$$

- τ Means value of time, the value r refers to timed transitions density or rate. So, in case of a need set 10 seconds as value of time; that would mean that the rate value should be equal to 0.1.

- The transitions value is fixed; in each model; the value was set to 20 firings. Conducting the simulation with this value of firings, we get the numerical data as shown in table 5.

Table 5

The density of tokens in places behaving as controllers in SDN

Algorithms Places/k_i	Parallel Structure/ Z_{Ki}	Ordinary Structure/ Z_{Ki}
P3		1.99975≈2
P1	0	
P5	0	
P9	0	

The table 5 shows that by leveraging the parallel network structure or topology; the requests that the controllers deal with per time unit; will decrease in comparison with those data requests that are being handled via a single controlling node in the Ordinary SDN structure. This would show the SDN structure's effectiveness in comparison to the Ordinary topology.

- *Defense Factor formula elaboration*

From the previous table we can see that SDN Parallel model can be more reliable because its controllers are mostly empty during the firings period. This means that the network that uses this topology will be having less occupied controllers hence, less DoS/DDoS attacks prone controllers because they will be more capable of dealing with requests.

So, using a module of PIPE software named as Generalized Stochastic Petri Nets (GSPN). GSPN is incorporated; within the PIPE, software can help in figuring out the results mentioned earlier. The gained data can be leveraged; in the equation that we suggest. This equation was made by observations based on various firings. This equation could be leveraged for assessment of SDN level of security in terms of cyberattacks especially those attacks that can exploit the busyness of controllers and use them for their advantage including the Denial of Service and Distributed Denial of Service threats; and that suggested formula is named as Defense Factor of Computer Networks. It is necessary to explain the basics on which the equation was formulated and the reasons of its formulation. This formula is derived to assess the effect of cyber-threats especially DoS/DDoS threats because of the key characteristic it has. This characteristic is the amount of requests being dealt with via network controlling node per unit of time. As mentioned earlier DoS/DDoS, attacks comprise submerging the intended attack point with pseudo requests in gigantic amounts, in order to disrupt or disable it completely. So, it should be known that the less occupied server/controller the better it is; since it will gain better ability in dealing with those requests; meaning a higher deterrence ability and a bigger response period. Therefore, this equation emphasizes the idea that states whenever the amount of requests is reduced the higher the security of the controllers will be. It is worth mentioning that this scientific work concentrates on increasing the networks security in the overall perspective, especially SDN. The controller is the core of the targeted SDN structure that needs to be protected and needs its level of security to be estimated, so that's why it is critically important to incorporate this component with the equation in order for its security level assessment hence, determining the network's security level.

$$\text{Let DF} = f\{K, Z\}, \qquad (2)$$

K is a symbol for controllers' quantity, while Z refers to how many requests are handled at a given time unit. Using the previous equation alongside Petri Nets elaborated models; gives a relationship that connects all of them and that is elaborated equation. Computer network requests in PN system are represented; by the amount of tokens occupying places that refer to control plane nodes.

Mathematical description of proposed Defense Factor formula is as the follows:

$$\text{DF} = \sum_i^n K_i \cdot \frac{1}{\sum_0^\infty z_{k_i}}, \qquad (3)$$

where DF represents Defense Factor of SDN ability to defend itself against cyber-threats, DF is equal to the summation of K_i, which refers to PN places quantity / control plane nodes, where $K_i = (K_1, K_2... K_n)$ and that summation is multiplied by 1 divided by Z_{Ki} which refers to the tokens' density /requests in those places K_i, $Z_{Ki} = (0... \infty)$.

Because the more controllers SDN structure has; the better defense capability the network has against the DoS/DDoS attacks while the more requests the structure has; the less deterrence the SDN has hence, we can say that K_i should be directly proportional to DF in the formula while Z_{Ki} should be inversely proportional to the value of DF.

$$\text{Let A} = \frac{1}{\sum_{z=0}^{z=\infty} z_{k_i}} \qquad (4)$$

$$\text{A} = \qquad (5)$$

Now if we implement the numerical data gained from simulation in this equation; we get the following Ordinary topology's DF value:

DFO = $Ko_i.1/Zo_i$ = 1 x $(1/T_{P3})$ à knowing that T_{P3} is the total average number of tokens in place number 3 that represents the main controller, that means:

DFO=1x1/1.99975 = 0.50

DF of suggested Parallel structure will be as follows:

DFP= $Kp_i.1/Zp_i$ = 3 x $(1/T_{P1}+T_{P5}+T_{P9})$ à where T_{P1}, T_{P5}, T_{P9} refer to the tokens' density in those places 1, 5 and 9 respectively. These places represent the three main controllers in the SDN parallel structure, and this would mean:

DFP=3x1/0 = ∞ ≈ optimal è theoretically

In conclusion, it is possible to notice here, that the Parallel structure represents a better quality in terms of security as compared to the Ordinary single-controller SDN model. In terms of DF, it is possible to compare the two SDN models as shown in Table 6.

Table 6

Parallel and Ordinary SDN models in term of their DF values

Algorithm	Parallel Model	Ordinary Model
Defense factor DF	$\approx \infty$	0.50

4. Conclusions

The paper here, concentrates on increasing the software-defined network's protection hence, turning SDN into a more protected environment, leading to protecting networks generally if those networks leverage the SDN structure.

This paper explains briefly, the previously proposed algorithms in the research. Those algorithms work together as a whole suite called the Hydra framework that will be used by the software-defined controllers to give them a better security and reliability in managing the network.

The presented Hydra framework is optional to be leveraged by the suggested topologies to solve issue of Single Point of Failure (SPOF) that serves as a positivity and an issue at the same time, due to its ability to facilitate the network management and at the same time can raise some security threats; since it promotes a single point of failure (SPOF).

This article gives an explanation about Parallel SDN model which is one of the three proposed topologies by the research.

The paper here gives a modelling approach for the Parallel model via the system of Petri Nets (PN) to extrapolate a relationship which is used for mapping the level of cyber-threats in networking environment that leverage anyone of the suggested SDN structures.

This article compared between data received from the usage of GSPN module for Ordinary and Parallel topologies to see the effect of using parallel topology and then apply the results on the defense factor formula to see the mathematical and theoretical reliability of the newly proposed topology and its advantages over the Ordinary topology.

The results gained by using the defense factor formula were promising and show a great overall enhancement on the performance of the SDN paradigm when dealing with requests.

The gained defense factor (DF) value of Parallel SDN model was infinity which is merely a theoretical and mathematical result showing that the average tokens' number in controlling places / SDN control plane nodes; was zero most of the elapsed operation time.

Conflicts of Interest: The author declares no conflict of interest.

**Annex 1. Simulation process of Petri Nets Model of Parallel Topology.**
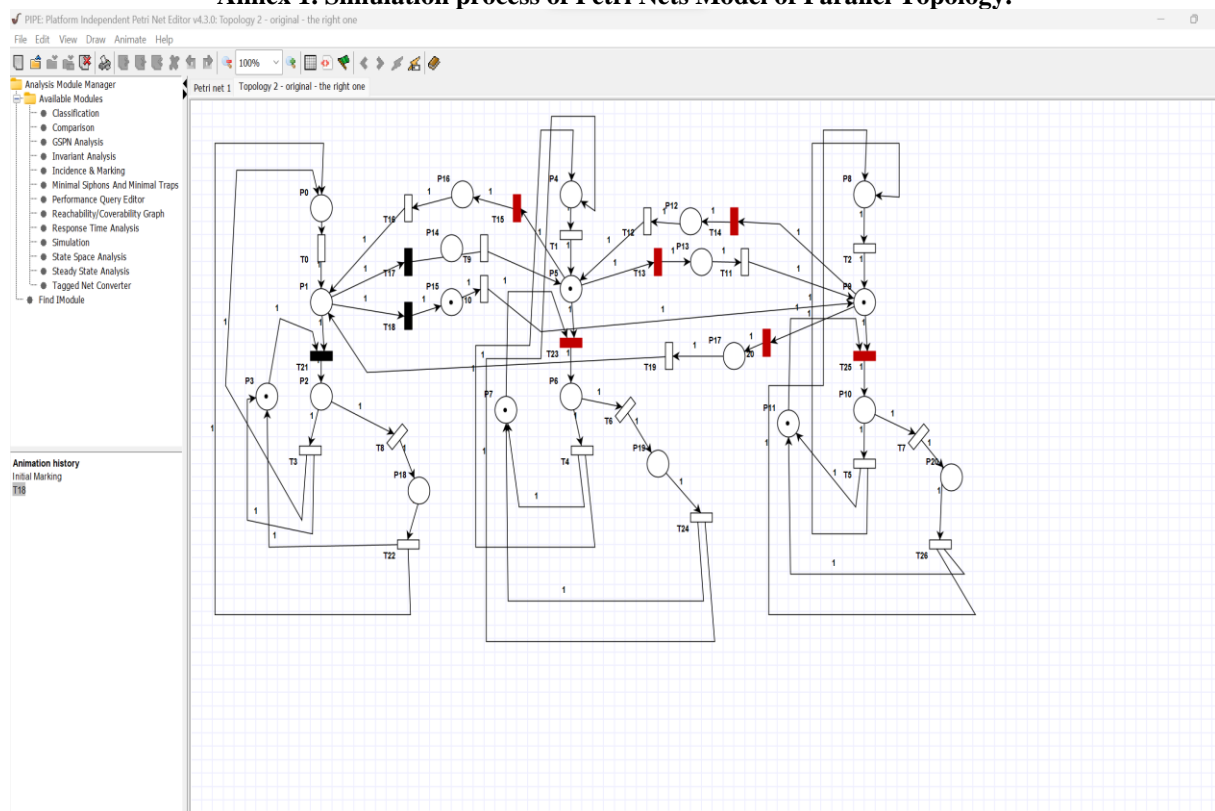
Annex 2. Table showing the Average number of tokens (network requests) on a place (main controller) for the Parallel topology.

Average Number of Tokens on a Place

Place	Number of Tokens
P0	0.23658
P1	0
P10	0.10948
P11	0.78103
P12	0.32674
P13	0.32664
P14	0
P15	0.32669
P16	0.32663
P17	0.32674
P18	0.1093
P19	0.10933
P2	0.1093
P20	0.10948
P3	0.78139
P4	0.23664
P5	0
P6	0.10933
P7	0.78134
P8	0.23711
P9	0

Annex 3. Simulation process of Petri Nets Model of Ordinary Topology.
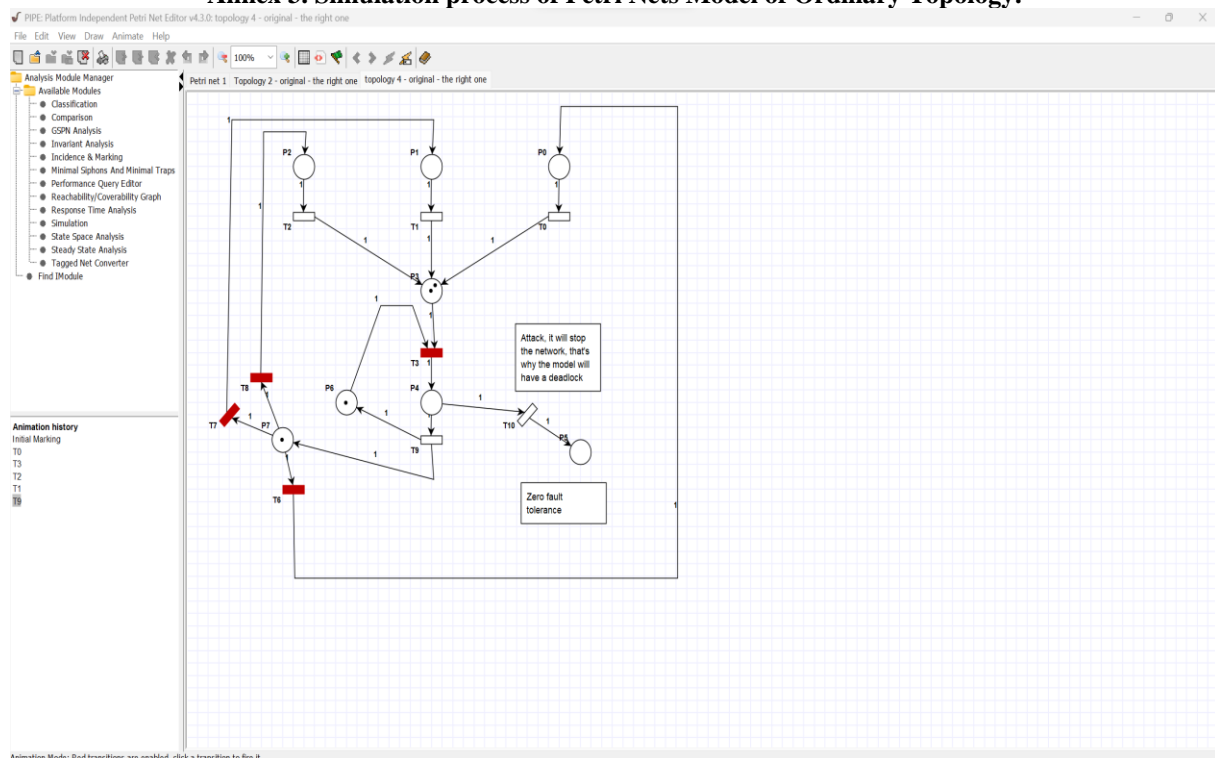
Annex 4. Table showing the Average number of tokens (network requests) on a place (main controller) for the Ordinary topology.

Average Number of Tokens on a Place

Place Number of Tokens	
P0	0
P1	0
P2	0
P3	2
P4	0
P5	1
P6	0
P7	0

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