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SECTION 1. Theoretical research in mathematics

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EXACT SOLUTION OF SOME NONLINEAR EVOLUTIONARY EQUATIONS USING THE MODIFIED SIMPLE EQUATION METHOD

Abstract: *In this paper, modified simple equation method, sine-cosine method and tanh-coth method has been applied to obtain generalized solutions of Nakoryakov-Pokusayev-Shreyber and Klein-Gordon equations. The new exact solutions of these equations have been obtained. It has been shown that the proposed methods provide a very effective, and powerful mathematical tool for solving nonlinear partial differential equations.*

Key words: *equation Nakoryakov-Pokusayev-Shreyber, equation Klein-Gordon, modified simple equation method, sine-cosine method, tanh-coth method, exact solutions.*

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ТОЧНОЕ РЕШЕНИЕ НЕКОТОРЫХ НЕЛИНЕЙНЫХ ЭВОЛЮЦИОННЫХ УРАВНЕНИЙ УПРОЩЕННЫМ МЕТОДОМ УКОРОЧЕННЫХ РАЗЛОЖЕНИЙ

Аннотация: *Упрощенный метод укороченных разложений, метод синус-косинус функций и метод tanh-coth функций применены для нахождения точного решения нелинейных уравнений Накорякова-Покусаева-Шрейбера и Клейна-Гордона. Получены новые точные решения этих уравнений. Показано, что эти методы являются эффективные и более мощные математические инструменты для решения нелинейных дифференциальных уравнений в частных производных.*

Ключевые слова: *уравнения Накорякова-Покусаева-Шрейбера, уравнения Клейна-Гордона, упрощенный метод укороченных разложений, метод синус-косинус функций, метод tanh-coth функций, точное решение.*

Введение.

Математическое моделирование многих реальных явлений приводится к нелинейным дифференциальным уравнениям в частных производных. Особенно эволюционные уравнения появляются в широком диапазоне научного исследования в различных областях, таких как плазменная физика, высокая энергетика, ядерная физика, оптоволокно, твердая физика, гидроаэромеханика, биомеханика, газовая динамика, теории упругости, химические реакции, геохимия, биохимия, метеорология, и т.д. Во многих задачах очень важно сначала анализировать стационарное решение краевой задачи и сделать некоторые физические выводы смотря по

результатам расчетов, которые описывают поведение уединенных волн в исследуемой области. До настоящего времени разработаны многие уникальные методы, чтобы исследовать почти все виды эволюционные уравнения и получить их точное решение. Например, предложены много сильных методов для решения нелинейных дифференциальных уравнений в частных производных, таких как гомотопический метод малого параметра [3; 9; 10; 17], метод exp-функции [5; 8; 14; 15], метод tanh-coth функций [16; 17; 21], метод синус-косинус функций [17; 18], метод вариационных итераций [1; 2; 6; 7; 17], метод разложения Адомина [17], упрощенный метод укороченных разложений [4; 11-13; 19; 21; 23] и другие, а также их различные модификации. Эти методы получили популярность в широком диапазоне научных исследований из-за их прямой простой процедуры вычисления.

Цель данной статьи состоит в том, чтобы показать эффективности упрощенного метода укороченных разложений, метода синус-косинус функций и метода tanh-coth функций, возможности легко, быстро и точно решать большой класс нелинейных задач. Ниже кратко изложены основной суть этих методов, и они применены для решения конкретных тестовых задач для демонстрации быстроты и точности данных методов.

Постановка задачи, алгоритмы упрощенного метода укороченных разложений, метода синус-косинус функций и метода tanh-coth функций.

Требуется решить следующую нелинейное уравнение, заданное в неявной форме

$$F(u,u_t,u_x,u_{tt},u_{xx},\ldots)=0\,, \qquad (1)$$

где $u=u(x,t)$ - неизвестная функция, а F является неявной функцией зависящая от $u(x,t)$ и его различные частные производные; $u_t=\partial u/\partial t$; $u_x=\partial u/\partial x$ и т.д.

1) Основные этапы *упрощенного метода укороченных разложений*:

Шаг 1. Используя преобразование

$$u(x,t)=u(\xi),\quad \xi=x-ct\,, \qquad (2)$$

где c – постоянный. Мы можем переписать уравнение (1) как следующее нелинейное обыкновенное дифференциальное уравнение (ОДУ):

$$P(u,u',u'',u''',\ldots)=0\,, \qquad (3)$$

где верхние индексы обозначают производные относительно ξ; P - неявная функция u и его полных производных относительно ξ. Затем интегрируем ОДУ (3) столько раз, сколько это возможно, устанавливая постоянную интегрирования равной нулю.

Шаг 2. Предположим, что формальное решение уравнения (2) может быть выражено следующим образом

$$u(\xi)=\sum_{k=0}^{N}a_k\left[\frac{\psi'(\xi)}{\psi(\xi)}\right]^k\,, \qquad (4)$$

где a_k (k = 0, 1, 2, …, N) - произвольные постоянные, которые будут определены таким образом, который $a_N\neq 0$; $\psi(\xi)$ - неизвестная функция, которая будет определена позже.

Шаг 3. Положительное целое число N может быть определено, считая гомогенный баланс между самым высоким порядком производной и с самым высоким порядком нелинейности, появляющимся в уравнение (3).

Шаг 4. Вычисление всех необходимых производных $u',u'',u''',\ldots$, входящие в уравнение (3) на основе (4) и подстановка их на место. Приравнивание все коэффициенты $\psi^{-j}(\xi)$ к нулю, где $j\geq 0$. Эта операция приводит к системе который может быть решен, чтобы найти a_k (k = 0, 1, 2, …, N) и $\psi(\xi)$. Замена значений a_k и $\psi(\xi)$ в (4) заканчивает определение решения уравнение (1).

2) основные этапы метода *синус-косинус функций*:

Шаг 1. Повторяется.

Шаг 2. Следуя выводам работ [17; 18], решения (3) могут быть установлены в виде

$$u(\xi)=\lambda\sin^{\beta}(\mu\xi)\quad\text{или}\quad u(\xi)=\lambda\cos^{\beta}(\mu\xi), \qquad (5)$$

где λ, μ, β - определяемые параметры; $|\xi|\leq\frac{\pi}{2\mu}$.

Шаг 3. Как следствие, производные (5) становятся

$$u_\xi=\lambda\beta\mu\sin^{\beta-1}(\mu\xi)\cos(\mu\xi),$$
$$u_{\xi\xi}=\lambda\beta(\beta-1)\mu^2\sin^{\beta-2}(\mu\xi)-\lambda\beta^2\mu^2\sin^{\beta}(\mu\xi)$$

или

$$u_\xi=-\lambda\beta\mu\cos^{\beta-1}(\mu\xi)\sin(\mu\xi), \qquad (6)$$
$$u_{\xi\xi}=-\lambda\beta^2\mu^2\cos^{\beta}(\mu\xi)+\lambda\mu^2\beta(\beta-1)\cos^{\beta-2}(\mu\xi)$$

и так далее.

Шаг 4. Подставим соотношений (6) в приведенного уравнения (3) и будем решать полученную систему алгебраических уравнений с помощью компьютеризированных символических пакетов. Далее мы собираем все члены с функциями $\sin^{\beta}(\mu\xi)$ для балансирования синусов или $\cos^{\beta}(\mu\xi)$ для балансирования косинусов, и приравниваем к нулю их коэффициентов, чтобы получить

систему алгебраических уравнений с неизвестными λ, μ, β. Далее решим последующую систему, чтобы получить все возможные значения этих параметров.

3) основные этапы метода *tanh-coth функций*:

Шаг 1. Повторяется 1-шаг 1-го алгоритма.

Шаг 2. Следуя выводам работ [16; 17; 21], решения (3) могут быть установлены в виде

$$u(\xi) = \sum_{k=0}^{N} a_k y^k + \sum_{k=1}^{N} b_k y^{-k}, \qquad (7)$$

где $y = y(\xi) = \tanh(\mu\xi)$ или $y = y(\xi) = \coth(\mu\xi)$; a_k (k = 0, 1, 2, …, N) и b_k (k = 1, 2, …, N) - произвольные постоянные, которые будут определены таким образом, который $a_N \neq 0$ или $b_N \neq 0$; □- определяемый параметр.

Шаг 3. Повторяется 3-шаг 1-го алгоритма.

Шаг 4. Повторяется 4-шаг 1-го алгоритма, но с учетом неизвестных коэффициентов a_k, b_k и неизвестной функции $y = y(\xi) = \tanh(\mu\xi)$ или $y = y(\xi) = \coth(\mu\xi)$.

Основным преимуществом этих методов являются то, что они может быть применены непосредственно к большинству типов дифференциальных уравнения. Другим важным преимуществом этих методов являются то, что они способны значительно сократить размер вычислительной работы.

Пример 1.

Рассмотрим уравнение Накорякова-Покусаева-Шрейбера в виде [20; 22]

$$u_{tt} - c_0^2 u_{xx} + \beta(u_{tt} - c_1^2 u_{xx})_{tt} = \alpha(u^2)_{xx}, \quad (8)$$

где α и β – некоторые константы.

Впервые это уравнение было применена для изучения распространения и взаимодействия нелинейных волн в жидкостях с газовыми пузырьками [22]. Там константы c_0 и c_1 – скорость распространения основного и предвестника сигналов соответственно, α – коэффициент нелинейности; β – параметр дисперсии. Упрощенный метод укороченных разложений позволяет исследовать процессов распространения и взаимодействия локализованных стационарных волн возмущений в дисперсной среде, описываемой уравнением [20; 22].

Чтобы применить упрощенного метода укороченных разложений и метода синус-косинус функций к уравнению (8), надо вводит переменную ξ как $\xi = x - ct$. Тогда вместо уравнение (8) получим следующую уравнение

$$u'''' + au'' + b(u^2)'' = 0,$$

где a и b – постоянные зависящие от скорости стационарной волны [1]:

$$a = \frac{c^2 - c_0^2}{\beta c^2 (c^2 - c_1^2)}, \qquad b = -\frac{\alpha}{\beta c^2 (c^2 - c_1^2)}.$$

Интегрируя этого уравнения в два раза и приравнивая к нулю постоянные интегрирования, получим

$$u'' + au + bu^2 = 0. \qquad (9)$$

1) *Упрощенный метод укороченных разложений*. Предположим, что решение уравнение ОДУ (9) может быть выражено полиномом по $\psi'(\xi)/\psi(\xi)$ как показано в (4). Условие балансирование u^2 и u'' в уравнении (9) дает: $N + 2 = 2N$, т.е. $N = 2$. Таким образом, мы можем написать (4) как следующая простая форма

$$u(\xi) = a_0 + a_1 \frac{\psi'(\xi)}{\psi(\xi)} + a_2 \left[\frac{\psi'(\xi)}{\psi(\xi)}\right]^2, \qquad (10)$$

где a_0, a_1 и a_2 - константы, которые будут определены таким образом, чтобы выполнялось условие a_2 □ 0. Легко получим следующие равенства:

$$u^2 = a_0^2 + 2a_0 a_1 \frac{\psi'}{\psi} + \left(a_1^2 + 2a_0 a_2\right)\left(\frac{\psi'}{\psi}\right)^2 + 2a_1 a_2 \left(\frac{\psi'}{\psi}\right)^3 + a_2^2 \left(\frac{\psi'}{\psi}\right)^4;$$

$$u'' = 2a_2 \left[\frac{\psi''}{\psi} - \left(\frac{\psi'}{\psi}\right)^2\right]^2 + \left(a_1 + 2a_2 \frac{\psi'}{\psi}\right)\left[\frac{\psi'''}{\psi} - 3\frac{\psi'\psi''}{\psi^2} + 2\left(\frac{\psi'}{\psi}\right)^3\right]. \qquad (11)$$

Эти выражения (10) и (11) подставляем в уравнение (9) и приравниваем к нулю коэффициентов ψ^0, ψ^{-1}, ψ^{-2}, ψ^{-3}, ψ^{-4}. Тогда имеем следующую систему уравнений относительно неизвестных констант a_0. a_1 и a_2:

$$\psi^0: \; aa_0 + ba_0^2 = 0 \; □ \; a_0(a + ba_0) = 0; \qquad (12)$$

$$\psi^{-1}: \; (aa_1 + 2ba_0 a_1)\psi' + a_1\psi''' = 0 \; □ \; (a + 2ba_0)\psi' + \psi''' = 0; \qquad (13)$$

$$\psi^{-2}: \; (aa_2 + ba_1^2 + 2ba_0 a_2)(\psi')^2 + 2a_2(\psi'')^2 - 3a_1\psi'\psi'' + 2a_2\psi'\psi''' = 0; \qquad (14)$$

$$\psi^{-3}: \; 2(ba_1 a_2 + a_1)(\psi')^3 - 10a_2(\psi')^2\psi'' = 0 \; □ \; (ba_1 a_2 + a_1)\psi' - 5a_2\psi'' = 0; \qquad (15)$$

$$\psi^{-4}: \; (ba_2^2 + 6a_2)(\psi')^4 = 0 \; □ \; ba_2 + 6 = 0 \qquad (16)$$

Из уравнений (12) и (16) имеем:

$$a_0 = 0 \text{ или } a_0 = -\frac{a}{b}; \; a_2 = -\frac{6}{b} \; (a_2 \neq 0).$$

Рассмотрим частные случаи:

Случай 1. $a_0 = -\frac{a}{b}$ и $a_2 = -\frac{6}{b}$, тогда из уравнений (13) и (15) получим

$$\frac{\psi'''}{\psi''} = \delta \;\square\; \psi'' = c_2 e^{\delta\xi};$$

$$\psi' = c_2 m e^{\delta\xi} \;\square\; \psi(\xi) = c_1 + \frac{c_2 m}{\delta} e^{\delta\xi},$$

где c_1 и c_2 – постоянные интегрирования;

$$m = \frac{5a_2}{a_1 + ba_1a_2};\ \delta = -m(a + 2ba_0).$$

Из уравнения (14) получим уравнение относительно неизвестного a_1:

$$ba_1^2 - \frac{3}{m}a_1 + \frac{2}{m^2}a_2 - aa_2 - 2ba_0a_2 = 0.$$

Отсюда $a_1 = \frac{6}{b}\sqrt{a}$; $m = \frac{1}{\sqrt{a}}$; $\delta = \sqrt{a}$.

Тогда точное решение уравнение (9) имеет форму

$$u(\xi) = a_0 + a_1\frac{c_2 m\delta e^{\delta\xi}}{c_1\delta + c_2 m e^{\delta\xi}} + a_2\left(\frac{c_2 m\delta e^{\delta\xi}}{c_1\delta + c_2 m e^{\delta\xi}}\right)^2 \quad (17)$$

Если $c_1 = 1,\ c_2 m = \delta$, то

$$u(\xi) = a_0 + \frac{1}{2}a_1\delta\left(1 + \tanh\frac{\delta\xi}{2}\right) + \\ + \frac{1}{4}a_2\delta^2\left(1 + \tanh\frac{\delta\xi}{2}\right)^2 = -\frac{a}{b}\left(1 - \frac{3}{2}\operatorname{sech}^2\frac{\sqrt{a}\xi}{2}\right). \quad (18)$$

Если $c_1 = -1,\ c_2 m = \delta$, то

$$u(\xi) = a_0 + \frac{1}{2}a_1\delta\left(1 + \coth\frac{\delta\xi}{2}\right) + \\ + \frac{1}{4}a_2\delta^2\left(1 + \coth\frac{\delta\xi}{2}\right)^2 = -\frac{a}{b}\left(1 + \frac{3}{2}\operatorname{csch}^2\frac{\sqrt{a}\xi}{2}\right). \quad (18')$$

Случай 2. $a_0 = 0$ и ($a_2 \neq 0$), тогда получим $a_1 = \frac{6}{b}\sqrt{-a}$; $m = \frac{1}{\sqrt{-a}}$; $\delta = \sqrt{-a}$.

Если $c_1 = 1,\ c_2 m = \delta$, то

$$u(\xi) = \frac{1}{2}a_1\delta\left(1 + \tanh\frac{\delta\xi}{2}\right) + \\ + \frac{1}{4}a_2\delta^2\left(1 + \tanh\frac{\delta\xi}{2}\right)^2 = -\frac{3a}{2b}\left(1 - \tanh^2\frac{\sqrt{-a}\xi}{2}\right).$$

Если $c_1 = -1,\ c_2 m = \delta$, то

$$u(\xi) = \frac{1}{2}a_1\delta\left(1 + \coth\frac{\delta\xi}{2}\right) + \\ + \frac{1}{4}a_2\delta^2\left(1 + \coth\frac{\delta\xi}{2}\right)^2 = -\frac{3a}{2b}\left(1 - \coth^2\frac{\sqrt{-a}\xi}{2}\right).$$

Для определенных значений параметров в обобщенном точные решения (17) и (18), получаем уединенную волновую решению. Различные значения произвольные постоянные c_1 и c_2, приводят к разнообразным уединенным формам волны. Свободные параметры могут подразумевать некоторые физические значащие результаты в гидроаэромеханике, газовой динамике и т.д.

2) *Метод синус-косинус функций.*

Подставив (5) и (6) в (9) получаем

$$-\lambda\beta^2\mu^2\cos^{\beta}(\mu\xi) + \lambda\mu^2\beta(\beta-1)\cos^{\beta-2}(\mu\xi) + \\ + a\lambda\cos^{\beta}(\mu\xi) + b\lambda^2\cos^{2\beta}(\mu\xi) = 0.$$

Приравнивая показатели степени и коэффициенты каждой пары функций косинуса в этом уравнение, мы находим следующую алгебраическую систему:

$$2\beta = \beta - 2,\ \cos^{-2}(\mu\xi):\ a\lambda - \lambda\beta^2\mu^2 = 0,$$

$$\cos^{-4}(\mu\xi):\ b\lambda^2 + \beta(\beta-1)\mu^2\lambda = 0.$$

Решение этой системы приводит к $\beta = -2$, $\mu = \pm\frac{\sqrt{a}}{2}$, $\lambda = -\frac{3a}{2b}$. Тогда подставив это в уравнение (6), получим точное решение уравнения (9) аналогично (18):

$$u(\xi) = -\frac{3a}{2b}\operatorname{sech}^2\left(\frac{\sqrt{a}}{2}\xi\right).$$

При замене $u(\xi) = \lambda\sin^{\beta}(\mu\xi)$ получим точное решение уравнения (9) аналогично (18′):

$$u(\xi) = -\frac{3a}{2b}\operatorname{csch}^2\left(\frac{\sqrt{a}}{2}\xi\right).$$

Таким образом, оба методы дают точное решение уравнения (8).

Пример 2.

Рассмотрим нелинейное уравнение Клейна-Гордона в виде [17; 21]

$$u_{tt} - c_0^2 u_{xx} + u - \frac{1}{6}u^3 = 0, \quad (19)$$

где u - смещение; x - лагранжевая координата; t - время; c_0 - скорость волны; γ - константа.

Чтобы применить упрощенного метода укороченных разложений и метода tanh-функции к уравнению (19), надо вводит переменную ξ как $\xi = x - ct$, где c - волновое число. Тогда вместо уравнение (19) получим следующую уравнение

$$u'' + au + bu^3 = 0, \quad (20)$$

где $a = 1/(c^2 - c_0^2)$; $b = -a/6$.

1) *Упрощенный метод укороченных разложений.*

Предположим, что решение уравнение ОДУ (20) может быть выражено полиномом по $\psi'(\xi)/\psi(\xi)$ как показано в (4). Условие балансирование между u^3 и u'' в уравнении (20) дает: $N + 2 = 3N$, т.е. $N = 1$. Таким образом, мы можем написать (4) как следующая простая форма

$$u(\xi) = a_0 + a_1\frac{\psi'(\xi)}{\psi(\xi)}, \quad (21)$$

где a_0 и a_1 - константы, которые будут определены таким образом, чтобы выполнялось

условие $a_1 \neq 0$. Легко получим следующие равенства:

$$u^3 = a_0^3 + 3a_0^2 a_1 \frac{\psi'}{\psi} + 3a_0 a_1^2 \left(\frac{\psi'}{\psi}\right)^2 + a_1^3 \left(\frac{\psi'}{\psi}\right)^3;$$

$$u'' = a_1 \left[\frac{\psi'''}{\psi} - 3\frac{\psi'\psi''}{\psi^2} + 2\left(\frac{\psi'}{\psi}\right)^3\right]. \qquad (22)$$

Эти выражения (21) и (22) подставляем в уравнение (20) и приравниваем к нулю коэффициентов ψ^0, ψ^{-1}, ψ^{-2}, ψ^{-3}. Тогда имеем следующую систему уравнений относительно неизвестных констант a_0 и a_1:

$$\psi^0: \; a_0 - \frac{1}{6}a_0^3 = 0 \Rightarrow a_0\left(1 - \frac{1}{6}a_0^2\right) = 0; \qquad (23)$$

$$\psi^{-1}: \left(a_1 - \frac{1}{2}a_0^2 a_1\right)\psi' + \frac{a_1}{a}\psi''' = 0 \Rightarrow$$

$$\left(1 - \frac{1}{2}a_0^2\right)\psi' + \frac{1}{a}\psi''' = 0; \qquad (24)$$

$$\psi^{-2}: \; -\frac{1}{2}a_0 a_1^2 (\psi')^2 - 3\frac{a_1}{a}\psi'\psi'' = 0 \Rightarrow$$

$$\frac{1}{2}a_0 a_1 \psi' + \frac{3}{a}\psi'' = 0; \qquad (25)$$

$$\psi^{-3}: \left(2\frac{a_1}{a} - \frac{1}{6}a_1^3\right)(\psi')^3 = 0 \Rightarrow$$

$$\frac{2}{a} - \frac{1}{6}a_1^2 = 0. \qquad (26)$$

Из уравнений (23) и (26) имеем:

$$a_0 = 0; \quad a_0 = \pm\sqrt{6}; \quad a_1 = \pm 2\sqrt{\frac{3}{a}}.$$

Рассмотрим частные случаи:

Случай 1. $a_0 = \pm\sqrt{6}$ и $a_1 = \pm 2\sqrt{\frac{3}{a}}$, тогда из уравнений (24) и (25) получим

$$\frac{\psi'''}{\psi''} = \delta \Rightarrow \psi'' = c_2 e^{\delta\xi};$$

$$\psi' = c_2 m e^{\delta\xi} \Rightarrow \psi(\xi) = c_1 + \frac{c_2 m}{\delta} e^{\delta\xi},$$

где c_1 и c_2 – постоянные интегрирования;

$$m = \frac{1}{b a_0 a_1}; \quad \delta = \frac{3(2 - a_0^2)}{a_0 a_1}.$$

Отсюда имеем точное решение уравнение (20)

$$u(\xi) = a_0 + a_1 \frac{c_2 m \delta e^{\delta\xi}}{c_1\delta + c_2 m e^{\delta\xi}} \qquad (27)$$

или точное решение уравнение (19)

$$u(x,t) = a_0 + a_1 \frac{c_2 m \delta e^{\delta(x-ct)}}{c_1\delta + c_2 m e^{\delta(x-ct)}}. \qquad (28)$$

Если $c_1 = 1$, $c_2 m = \delta$, то

$$u(x,t) = a_0 + \frac{1}{2}a_1\delta\left(1 + \tanh\frac{\delta(x-ct)}{2}\right).$$

Если $c_1 = -1$, $c_2 m = \delta$, то

$$u(x,t) = a_0 + \frac{1}{2}a_1\delta\left(1 + \coth\frac{\delta(x-ct)}{2}\right).$$

Случай 2. $a_0 = 0$ и $a_1 \neq 0$, тогда получим

$$u(x,t) = a_1 \frac{c_2 m \delta e^{\delta(x-ct)}}{c_1\delta + c_2 m e^{\delta(x-ct)}}.$$

Если $c_1 = 1$, $c_2 m = \delta$, то

$$u(x,t) = \frac{1}{2}a_1\delta\left(1 + \tanh\frac{\delta(x-ct)}{2}\right). \qquad (29)$$

Если $c_1 = -1$, $c_2 m = \delta$, то

$$u(x,t) = \frac{1}{2}a_1\delta\left(1 + \coth\frac{\delta(x-ct)}{2}\right), \qquad (29')$$

где $\delta = \sqrt{2a}$; $a_1\delta/2 = \sqrt{-a/b}$.

2) *Метод tanh-coth функций.*

Предположим, что решение уравнение ОДУ (20) может быть выражено полиномом по $y(\xi)$ как показано в (7). Условие балансирование u^3 и u'' в уравнении (20) дает: $N + 2 = 3N$, т.е. $N = 1$. Таким образом, мы можем написать (7) как следующая простая форма

$$u(\xi) = a_0 + a_1 y(\xi) + b_1 / y(\xi) \qquad (30)$$

где a_0, a_1 и b_1 - константы, которые будут определены таким образом, чтобы выполнялось условие $a_1 \neq 0$. Легко получим следующие равенства:

$$u(\xi) = a_0 + a_1 y + b_1 / y;$$

$$u''(\xi) = 2\mu^2(y^2 - 1)(a_1 y - b_1 / y^3). \qquad (31)$$

Эти выражения (31) подставляем в уравнение (20) и приравниваем к нулю коэффициентов y^0, y^1, y^2, y^3. Тогда имеем следующую систему уравнений относительно неизвестных констант a_0, a_1 и b_1:

$$a_0 a_1 = 0; \quad 2\mu^2 + b a_1^2 = 0;$$

$$-2\mu^2 + a + 3b a_0^2 + 3b a_1 b_1 = 0;$$

$$a_0\left(a + b a_0^2 + 6b a_1 b_1\right) = 0. \qquad (32)$$

Если в (32) $a_0 = 0$; $a_1 = \sqrt{-a/b}$ $b_1 = 0$; $\mu = \sqrt{a/2}$, то получим точное решение уравнения (19) аналогично (29):

$$u(x,t) = a_1 y(x,t) = \sqrt{-a/b}\tanh\left(\sqrt{a/2}(x - ct)\right),$$

а при замене $y = y(\xi) = \coth(\mu\xi)$ получим точное решение уравнения (19) аналогично (29'):

$$u(x,t) = a_1 y(x,t) = \sqrt{-a/b}\coth\left(\sqrt{a/2}(x - ct)\right).$$

Таким образом, оба методы дают точное решение уравнения (19).

Выводы.

В данной работе получены точное решение уравнений Накорякова-Покусаева-Шрейбера и Клейна-Гордона упрощенным методом укороченных разложений, а также показан возможности применения методов синус-косинус функций и tanh-coth функций. Законность и эффективность этих методов показывают, что методика решения нелинейных дифференциальных уравнений дает очень быстрая достижимость к точным решениям. Кроме того, можно прийти к заключению, что эти методы очень сильные и эффективные, которые может построить точное решение нелинейных дифференциальных уравнений. Поэтому эти эффективные методы могут быть использоваться в дальнейших работах, чтобы получить точное решение многих других нелинейных уравнений математической физики.

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SECTION 20. Medicine.

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COMPARISON OF ANXIETY AND DEPRESSION AMONG FEMAL-POPULATIONS IN BAHAWALPUR AND MULTAN (TWO CITIES OF PAKISTAN)

Abstract: *Objective: Objective of this study is the comparison of depression and anxiety among females of two cities of Pakistan, Bahawalpur and Multan.*

Design: It is a cross-sectional design of study.

Place and duration of study: This study was conducted in bahawal victoria Hospital of bahawalpur and Nishtar Hospital of Multan city from first June 2016 to 31 May 2017.

Subjects and Methods: Those female patients were included who reported in psychiatry out door of the Hospital and falling in the criteria of ICD-10. Which patients had other diseases as well or having difficulty in communication, were excluded. Their somatic symptoms were written down. Two groups of cases were made, 60 cases from Bahawalpur reported in B.V Hospital and 60 cases from Multan reported in Nishtar hospital. Data collected from both groups was compared. Cases from Bahawalpur were tagged as group-1 and those from Multan as group-2.

Result: Following somatic symptoms were recorded in both groups, headache-group-1 65%, group-2 71%, Pain in upper limbs and body in group-1&2- 80% & 90% respectively, constipation- 36% & 25% respectively, suffocation -18% and 22% respectively in both groups, joints pain- 30% & 34%, pain in abdomen -20% & 18%, palpitation- 52% & 45%, giddiness- 28% & 30%, which are almost equal in both groups. Which symptoms are different in both groups 1 & 2, include forehead pain -52% & 34%, pain in temporal region-50% & 35%, unilateral headache-28% & 12%, chest pain- 20% and 50%, dyspepsia-50% and 80%, hypo gastric pain 10% and 15% respectively in group-1 and group-2.

Conclusion: somatic symptoms due to anxiety or depression are much usual in females of both cities. There is little difference between these two groups which may be due to different areas.

Key words: *Female Populations, depression, anxiety, Bahawalpur, Multan*

Language: *English*

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INTRODUCTION

Any psychological disease expresses itself via somatic signs and symptoms. Females of our country experience such types of psychological problems frequently which may be due to financial problems, family matters, stress of job or depression of studies etc. Most of these cases are illiterate. Treatment of such cases is difficult as they don't prefer to go to any psychologist doctor instead they go to hakeems or general practitioners.[1]Mostly they are advised just

symptomatic treatment and underlying disease is not addressed. So as a result patient is not cured and she is not satisfied so she goes to other one to investigate its problem and this way it costs too much without proper treatment.[2]Underlying problem becomes worse and signs and new symptoms occur as disease goes on.[3]Considering these points this study was done to determine frequency of such somatic problems due to psychological diseases and their comparison was done between two groups of females from two cities. Many studies have been done in the past about anxiety and depression in females and its expression as somatic symptoms.[4]Our result is similar to the result of those studies. Presentation of the disease is different in different patients but most of the symptoms are same in all cases. Socioeconomic status and education are not the only factors of such somatic symptoms but many other factors play significant role as well.[5]In developed countries such somatic problems are common despite good literacy rate and good economic status that proves there are some other elements which play a role causing mental illness in females.[6]

SUBJECTS AND METHODS

There is a fully working psychiatric ward in Bahawal Victoria Hospital of Bahawalpur city and also in Nishtar Hospital of Multan a well developed Psychiatry department is functional. In both hospitals the out patients average is in the range of 150-200 patients daily. This research was started on first June 2017. All those female patients were selected which fall in the criteria of ICD-10. The minimum age of the patient was 18 years and maximum was 50 years. Mean age of the females were 28 years. Most of the patients were either illiterate or just primary pass. Their socioeconomic status was low. Many of them belonged to poor family. Which patients were having other morbidities or did not understand Urdu language were also excluded from the study. All somatic symptoms were recorded. All cases were divided into two groups. In group-1 patients from Bahawalpur City were included and in Group-2 Patients from Multan were included. Both groups were compared with each other. In each group 60 cases were present. These were patients which were reported in out-doors of Bahawal victoria Hospital and Nishter Hospital. Both hospitals are well developed and well equipped with health facilities.

RESULTS

Somatic symptoms of anxiety and depression in females of both groups were compared in the form of tables as given below. Which symptoms were nearly same in both groups include following. In Group-1 and Group-2, generalized headache - 65% and 71% respectively, pain in joints- 30% and 34%, abdominal pain- 20% and 18%, constipation-36% & 25%, palpitation- 52% & 45%, backache-50% & 52%,giddiness-28% & 30% respectively. Which symptoms were different in Group-1 and Group-2 respectively include, frontal headache-52% & 34%,bitemporal headache-50% & 35%, heavy eyes-30% & 10%, chest pain-20% & 50%, dyspepsia-50% & 80% and generalized body pain-70% & 35%.

Table-I

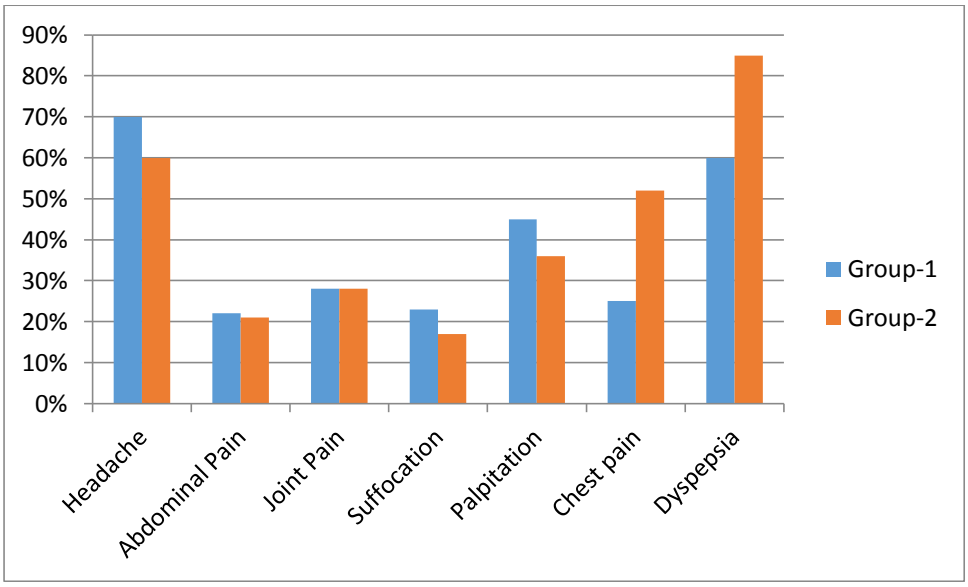
Symptoms similar in both groups

PHYSICAL SYMPTOMS	GROUP-1 (%)	GROUP-2 (%)
Pain in joints	30	34
Difficulty in breathing	18	22
Palpitation	52	45
Sense of fatigue	41	30
Altered bowel habits	36	25
Generalized pain in the head	65	71
Pain in upper limbs and upper body	80	90
Pain in the abdomen	20	18
Pain in backbone	50	52

Table-2

Physical symptoms different in two groups

PHYSICAL SYMPTOMS	GROUP-1 (%)	GROUP-2 (%)
Dyspepsia	50	80
Hypo gastric pain	10	15
Chest pain	20	50
Pain in half head	28	12
Pain in both temporal regions	50	35
Pain in the breast	4	35
Pain in the whole body	70	35
Heaviness of head	60	40
Feeling of heaviness of eyes	30	10



Picture 1 - Comparison of Somatic symptoms in Group-1 & group-2.

DISCUSSION

Females from low socioeconomic status have more psychological illness than others.[7] There was much similarity in somatic symptoms of two populations from different cities. There was also difference in few symptoms among two groups which was most probably due to socio-economic difference. Such as pain in neck and upper body, generalized headache, generalized weakness, backache, palpitation and easy fatigability are more common in the females of Bahawalpur and joint pain, suffocation and giddiness, central chest pain, dyspepsia are more common in females of Multan. It was observed that illiterate people were having more advance disease as compared to educated people. It is because uneducated females don't understand their psychological problems and don't treat them so disease goes on worsening. Even most of them don't consider it as a disease.[8] In the past many related studies have been done. In 1996 Abu Arafehi and Russel G determined relation between depression and abdominal pain in adults.[9] Similar study done by

Contello EJ and two others with him on mental illness in 1996.[10] Hyams JS studied irritable bowel syndrome and abdominal pain in adult patients.[11]A study done in 1981 in China by Achenbach TM. He studied depression in the people of China. According to his study 47% Chinese were suffering from depression. In 1991 and 1992 three scientists collected data of Five countries from WHO about somatic symptoms of people due to depression. Their result was 69% people were suffering from the illness.[11]Another research done in 1991 and 1992 by Simon GE and Vonkorff et al.[12]They determined association of somatization and mental distress. According to their result 49% people were having depression and 38% were suffering from anxiety. In 1989 Hamilton M did a study on symptoms of depression in patients.[13] Other studies done on the same topic by Goldberg, Mumford, Tareen I.A.K concluded same results as this study done.[14-18]In the light of all above studies it can be concluded that high percentage of people in western countries are suffering from mental illness despite very low rate of illiteracy.[19] So it can be said that illiteracy and poor economic conditions are not the only factors of mental illness. There are many other factors of this problem as well.[20-22]

CONCLUSION

Somatic symptoms are very common problems with which people present in hospitals. Due to lack of diagnostic skills and facilities of treatment such people remain ignored. Due to limited resources our health institutions can not deal with these problems. There is requirement of further work in this aspect. It is necessary to create awareness in the people of our community and people related to medical profession so that such problems may be diagnosed and treated early. Medical professionals should be as much skilled to diagnose such patients and send them to psychologist or psychiatrist.

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SECTION 19. Management. Marketing. Public administration.

GENESIS OF THE CONCEPT OF THE ESSENCE OF INNOVATIVE MARKETING

Abstract: *The article considers the basic prerequisites and possibilities of applying the concept of innovation marketing at enterprises that produce an innovative product. Economic indicators of innovation activity in Russia and abroad, the role of marketing in innovation management are given. Various approaches to the definition of marketing in the innovation sphere are analyzed. The characteristics defining the specifics of the modern toolkit for innovation marketing, related to the need to increase innovation activity, are given. The ways of further studying the concept of innovation marketing and the possibility of its application in innovation management are outlined. The article will be of interest to marketers and managers of innovative projects.*

Key words: *Innovative marketing, marketing of innovations, marketing innovations, management.*

Language: *English*

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Introduction

Innovative marketing is the concept of marketing, according to which the organization must continuously improve the products and methods of marketing. The logic of business development requires increasing the profitability of production and expanding the range. Both these goals or one of them can be achieved by developing new products. Of course, this is not the only tool for achieving these goals, but it is very important.

In innovative marketing methods, approaches and style of effective leadership vary depending on the situation. The system of innovation marketing activities is closely linked not only with the production renewal systems, but also with the dynamics of accumulation and capital overflow. The most important direction of marketing activities is the strategy and tactics of innovation penetration into the market, including the formation of a competitive strategy of innovation based on the formation of sales channels and the positioning of a new product.

The development of new technologies and the speed of the implementation on their basis of fundamentally new types of products and services lead to the fact that the needs of consumers and the situation on the market change with ever-increasing speed. The consumer dictates what, when and in what form he wants to receive and at what price. By isolating homogeneous groups of consumers through market research and identifying strategic segments, the company saves significant funds and achieves greater efficiency in subsequent contacts with current and potential customers.

Literature review

The issues of research of organizational and economic innovations acquire special relevance at the present stage of the country's economic development. The creation of a system for the effective management of innovative marketing activities and the practical development of marketing tools in the field of organizational and economic development * with the aim of increasing the capacity of domestic industrial enterprises is a new scientific one. direction, especially relevant: in the aspect of increasing competition, which confirms the relevance of the problem under consideration, the need for its comprehensive study.

The first major theorists of innovation processes are rightly considered J. Schumpeter [1] and F. Kotler [2-5] The notions of innovation processes, including those in small enterprises, are connected in the West with the names of H.G. Barnett, R. Duncan, P.F. Drucker, K. Davis, F. Kotler, J. Evans, P. Dickson, I. Doyle, J. Lamben, M. Porter [6], B.

Berman, D. Angela, Zavlin PN. [7], J.W. Newstrom, E.M. Rogers, R. Hizrich and other researchers.

And the issues of the competitiveness of goods and enterprises are devoted to the works of G.L. Azoeva, B. Alstrand, I. Ansoff, A.P. Gradov, I.B. Gurkova, B.C. Efremova, M.I. Knysh, F. Kotler, N.Yu. Kruglova, J. Lampel, G. Mintzberg, M. Porter, and others.

The problems of the introduction of modern marketing concepts, including the concept of innovative marketing, and the restructuring of business on their basis, have become the subject of research by Trias de Beza, Edward de Bono, Lyubarsky I [8], Golubkov. [9], Kopeikin M [10], Kuzmenko V. [11-12], Sadchikova I. [13], Sultanov O. [14], Khrutsky V.E., Korneeva I.V. [15], Hill Sam, Rifkin Glenn [16], and others.

However, most of the work is primarily of a general theoretical nature or is devoted to solving certain aspects of the problem. The issues of assessing and enhancing the competitiveness of high-tech enterprises, the conditions for developing and regulating their marketing activities, adequate to the production tasks of creating competitive products, have not received sufficient coverage.

Thus, the relevance of the marketing innovation problem, focused on enhancing the competitiveness of the EaP, is due to the lag in the Russian science-intensive goods and services in terms of competitiveness indicators from the products of the world's leading manufacturers. The mission of innovative marketing is to develop ways to increase the competitiveness of the EaP by researching, evaluating and optimizing its parameters.

At the same time, the studies underestimated the fact that the marketing approach to the management of innovation processes is an integrated approach that considers the product, innovation simultaneously from the point of view of both the producer and the consumer. At the same time, one can state that in modern domestic science there is no integral concept of the formation of a system for managing innovation activity, especially in the field of organizational and economic development of industry.

The concept and types of innovative marketing.

Innovative marketing– is all objectified type of production and economic activities of a firm or institution aimed at optimizing and controlling the innovative and production and marketing activities of the organization, based on research and active influence on the market conditions of the enterprise.

In other words, this is the concept of traditional marketing, according to which the organization must continuously improve products. Innovative marketing should include:

-conducting marketing researches of the market of innovations, including perspective deducing of innovation on new markets - diffusion of innovations;

- analysis of potential industrial consumption and demand for innovations (dynamics of consumption volumes, analysis of consumer market segments, determination of their volumes, analysis of effective consumer demand, demand structure, consumer preferences analysis, consumption motivation, trends and market prospects, assessment of existing and potential market capacity) ;

- analysis of competition in the markets (determination of the main competitors and their market shares, determination and analysis of competition points - quality, product characteristics, price, sales strategies, etc., analysis of strengths and weaknesses of competitors, analysis of commodity, marketing, advertising strategy competitors);

- analysis of pricing and price structure;

The object of innovative marketing are intellectual property, new materials and components, new products, new processes, new markets, new ways of promoting goods and services, and new organizational forms of management. The main thing in the marketing of innovations is the research and forecasting of the demand for a new product, based on a thorough study of the consumer's perception of innovation and the consumer's significant qualities and properties.

The innovative policy of the enterprise is aimed, first of all, at increasing the competitiveness of the products. Product, technological and resource innovations aimed at improving the quality and technical (consumer) characteristics of products, ensure the growth of competitiveness, resulting in increased demand for products and sales at the same price. With the growth of product competitiveness, it is possible to increase the price and, correspondingly, the volume of sales with the same demand. In this case, the profit increases, as well as the profitability of production.

Innovative marketing is the first stage of the life cycle of an object and, the first function of a functional subsystem of a management system.

The main terms of innovation marketing is the innovative potential of the organization - this is the degree of its willingness to perform tasks that ensure the achievement of the stated innovative goal, i.e. degree of readiness for the implementation of an innovative project or a program of innovative transformation and innovation. Innovative activity is often treated as an activity associated with the use of new technologies. Many enterprises are trying in one form or another to carry out innovative activities independently, through specially created subsidiaries or innovation centers designed to promote and use innovative products. Specialists - professionals in patent-licensing activity, protection of intellectual

property and other components necessary for the commercial use of innovations are hired. As a result of successful introduction of a new product to the market, the company usually either expands its product line, or fixes a new product category. The most common, the first option, it is less risky. But in the case of bringing to the market a completely new product, you can get a big profit and take a strategically advantageous position of the leader in the new product category. The idea of targeting innovation for higher consumer effects seems highly productive, but its rationale in the literature is rather technical and technological in nature. As a result, the presented innovation classification by the degree of its radicality (basic, improving, rationalizing) either generally loses its consumer content, or turns out to be focused on the company's internal environment. With this approach, the incentive motivation for the innovation process is naturally the need to replace obsolete equipment in order to increase the competitiveness of products. Organizations are exploring the end-user market, trying to predict future demand. These studies should be carried out and used by producers of final products: bread, milk, meat, etc. They need to monitor the new developments appearing on the market and, most importantly, for their prospects for the market situation.

In innovative marketing, innovation is divided according to the degree of potential:

- radical innovations - fundamentally new products and technologies. They are few in number and, as a rule, provide for the emergence of a new consumer and / or a new market;
- combinatorial innovations - a new combination of already known elements and properties. Combinatorial innovations are usually aimed at attracting new consumer groups and / or developing new markets;
- Modifying innovations - consist in improvement or addition of existing products. Modifying innovations are usually aimed at preserving or strengthening the market positions of the enterprise.

The concept of innovation marketing is the basis for the work of the entire marketing service, market research and the search for a competitive strategy of the enterprise. The paramount task of marketing units at the initial stage of the search for innovation is market research: the level of demand and competition, the behavior of the buyer and the dynamics of his preferences, the availability of competing products and the ability to consolidate the novelty in the market.

The marketing strategy, market analysis and operational marketing consist of six principal stages:

- general economic analysis of the market
- analysis of the economic conjuncture
- special market research
- development of innovation penetration strategy
- operational marketing activities
- Estimates of costs and revenues from marketing

From the concept of marketing follows that innovative marketing in the modern sense is a unity of strategies, business philosophy, functions and management procedures and methodological basis.

Innovative marketing for countries with economies in transition is, in fact, an innovation. In industrially developed countries, the marketing concept of the company's development has been an honorable place for decades. At the same time, it should be noted that the emergence of innovative marketing as a scientific discipline had only to last decades. Innovative marketing as a concept is broader than marketing innovation, it includes the mission of the organization, the philosophy of thinking, the field of scientific research, the style of management and behavior. This is a special type of relationship and full acceptance of risk.

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The modern economy is characterized by a high level of dynamism and instability. Of course, this has a negative effect on the activities of economic entities, because they do not have the ability to adapt so quickly to changes in the external environment. To bring internal business development opportunities in line with market conditions, one of the most sound means, at the moment, is the creation and dissemination of innovations. Practice confirms that almost all enterprises that successfully develop on the market are their success namely innovation. But the facts prove that the development and commercialization of new developments is very difficult. On the world the market annually displays about 100 thousand items of new products, of which only 2% are real innovations,

However, commercial success is not more than 25% [1]. Appropriate analysis and accounting at enterprises-innovators should engage in marketing services. Proceeding from the foregoing, we note that in order for the enterprise to develop, increase its competitiveness and took leadership positions it is necessary to adhere to two areas of activity - to develop and implement innovations and implement a marketing mix. About this, even at the beginning of the second half of the last century, such well-known scientists in the field marketing and management as F. Kotler and P. Drucker [2, 3].

According to the results of the research carried out by the authors regarding a combination of such categories as "marketing" and "innovations" It is established that there is no single definition that unites these categories. According to the authors, innovative marketing requires understanding the concept of doing business, which provides for Creation of improved or principally new products (technologies, services) - innovations - and use in the process All of its creation and distribution of improved or fundamentally new - innovative - tools, forms and methods marketing in order to better meet the needs of both consumers and producers. Let us examine in more detail the facts of the present, which the authors consider to be such that they prove the existence and necessity of The distinction in the separate concept of doing innovative marketing business. In all existing concepts, certain innovations are used. Thus, for example, the concept of production provides for the improvement of technology of production of goods, which can lead to the emergence of technology-innovation; the concept of product improvement is the improvement of the quality of the goods, which, to a certain extent, product innovation; the concept of intensification of commercial efforts;

market products, which may result in communication innovations; The concept of marketing - the emergence of new needs (consumer needs), which can be innovative; concept of social and ethical marketing provides for yet another group of needs-the needs of the entire society, that is, perhaps, of innovative needs. These facts are more the need to separate innovative marketing into a separate concept, because the process of creating and distributing innovation-part of each of the already existing concepts of doing business. But, note that it is partially. And all these concepts They do not provide for the constant creation of innovations and the use of innovative methods and marketing tools. Those,the number of innovative developments according to these concepts is not great, because it is not the goal. In recent years, the number of innovative developments, both in Ukraine and in the world, has significantly increased. One example there is China, which until recently was an underdeveloped country. In recent years, due to a significant increase in the number of China has made a sharp leap in its development and now almost all markets of the world there is Chinese products [17]. Also,The growth in the number of innovations in the

world is the fact that over the past 15 years the number of people working in the innovation sphere in the United States and Western Europe increased by 2 times, and in South-East Asia - by 4 times. Another important factor is that with the beginning of the use by the enterprises of the marketing concept of doing business in their activities, different kinds of marketing innovations. So, in terms of the frequency of implementation and multidimensionality, marketing innovations outstrip others. types of innovation. This is due to their relatively low "cost" and high variability [18-19]. All these facts testify to the There is a constant increase in the number of innovations. And in accordance with the second law of dialectics - the law of transition of quantity in quality,quantitative changes in phenomena up to a certain boundary are of the character of a continuous growth of one and the same itself. And at a certain stage of development, under certain conditions, the object loses its previous quality and becomes new. you m. Therefore, such a constant quantitative increase in innovation (both product and technology, and marketing) should lead to the emergence of some new quality, which, according to the authors, should be the concept of innovative marketing. Evidence that innovation development has "embraced" the world and the concept of innovative marketing is already active companies that seek to become leaders in their field are data on the 100 most innovative world companies, which were collected by the publishing house BusinessWeek and the management consulting company Boston Consulting Group [20]. So the first ten of the most innovative companies in the world included such companies as Apple, Google, 3M, Toyota, Microsoft, GE, Procter & Gamble, Nokia, Starbucks, IBM. All these companies are leaders among other companies in a certain area and all of them actively develop innovative products, services or technologies, and also use innovative approaches to implementation complex marketing. So, this is a clear example of the fact that all the most famous companies in the world carried out serious progress in their activities through daily innovation. It should be noted that according to this concept, the needs of consumers and producers are satisfied,the state of society as a whole is not yet being discussed. Therefore, the concept of innovative development should be the fifth concept -following the concept of marketing, i.e. Before the concept of social and ethical marketing.The authors believe that it is the concept of innovative marketing that can become that transitional concept, the step that co-The latter will allow to reach the peak, where the interests of producers, consumers and the whole society are united. First of all, commodity and services that are represented on the market today, do not meet the needs of society to the full, therefore need new, i.e. Innovative, in the production of which these needs will be taken into account. Secondly, in order for consumers to understand The importance of this kind of innovation (which satisfies not only their own needs but also the needs of society) to bring this thought to their consciousness. The only way to achieve this is the tools of marketing communications. And when It is necessary to use new, non-traditional methods and tools of marketing MUNICATIONS. And, thirdly, the production and distribution of innovations needed by consumers bring in excess of the profit that is the main need of producers. The author suggests the following variant of the graphic representation of the above-mentioned, as for the concept of innovative marketing. The key concept of such a science as marketing is the concept of "needs". It is their satisfaction that is the main goal. work of specialists in the field of marketing. And in general, the goal of the whole economy, as a science, is to find ways to meet the constant-but an increasing level of needs. On the author's opinion, the level of satisfaction needs corresponds to the diameter of the so-called "bowl". So, at first the enterprises satisfied only their own needs, while they were guided by the first three concepts. And with the advent of each of them, more and more of their needs were met. Then they realized that in order to better meet their own needs, it is necessary to take into account the needs of their potential consumers in their production activities. Ie, the level of satisfaction of needs has increased and the bowl has filled up. Have been. So, manufacturers began to use the concept of marketing. Further, according to the evolution of the concepts of doing business, the concept of social and ethical marketing, which provides for the satisfaction of the needs of the whole society. But how already mentioned earlier, in order for this to become a reality, it is necessary to sufficiently satisfy existing, as well as hidden or new needs of producers and consumers, i.e. fill the bowl to the required level. To do this, In its activity, the concept of innovative marketing. After that, the needs of the whole society also fall to the "cup" which must also be satisfied. Here, the concept of social and ethical marketing comes to the fore. Required Add that the concept of socio-ethical marketing can not be the last, because, as you know, the needs do not remain on the one level and are constantly increasing. And, perhaps, sometime, we will need to take into account during the production process not only the needs of producers, consumers and society, as well as other needs, for example, the needs of all mankind. Thus, the authors believe that today the concept of innovative marketing is a leading concept, which will help enterprises to make a sharp breakthrough in their activities and move to a qualitatively new level of development. it will allow domestic enterprises to get out of the crisis in which they are now, and catch up with trade turnover and profits foreign enterprises that work in a similar

sphere, and after a certain time, take the leading positions in the market.

Stages of innovative marketing.

Often, innovative marketing includes a set of activities aimed at analyzing the market, developing a marketing strategy to increase sales of this product and its practical implementation. For the successful promotion of the product, it is vitally important to apply the methods of strategic innovation marketing, whose goal is to develop a technology for penetrating a new product to the market. The specifics of innovative marketing include a clear division of the developed strategy for entering the market at certain stages and their passage in strict sequence. Let's consider them in more detail:

1. Typically, strategic innovation marketing first involves studying the macroeconomic situation in the country: the rate of inflation, the solvency of the population, its composition and growth rates, the political environment, changes in tax legislation, the volume of production of products similar to the product, etc.

2. Typically, the application of tactical innovation marketing technologies begins with a thorough analysis of the market attractiveness of the product. During this period, consumers' demand for a particular product is studied, for which customer surveys are conducted at retail outlets, questionnaires, etc. After processing this information using innovative marketing tools, it becomes clear which type of product, what quality and at what price will be most in demand in a particular market segment.

3. Innovative methods of marketing include the study of product competitiveness in the market and the definition of its position among a number of similar products.

4. After that, the so-called "portfolio" analysis is conducted, which consists in studying all areas of the enterprise's activities and identifying the most profitable of them. This is done in order to apply innovative marketing strategies, promote products that are most competitive and attractive to the consumer. Then the chosen strategy is implemented in practice in order to maximize profits and expand the market share of the product. During this period, the features of innovative marketing are a clear definition of the type of goods sold, the establishment of an optimal price for it, which makes it possible to get a good profit, but attractive enough for buyers, choice of the place of its implementation and promotion strategy (advertising campaign, improvement of production technology, etc.) .

- The following marketing strategies can be applied to the types of innovative marketing:
- The strategy of high prices, applied in the absence of fierce competition and the emergence of a completely new product, information about which is missing. It allows you to quickly get a significant profit at the expense of consumers with high solvency. Then the company can reduce the price and attract buyers from another market segment;
- penetration of the market, when the product is set low prices because of the large number of competitive goods;
- strategy of prestige. In this case, the use of innovative marketing is to convince the consumer that the high price corresponds to the high quality of the product, the acquisition of which is prestigious;
- he features of innovative marketing in the case of a strategy based on the opinion of consumers, can be attributed a thorough study of demand for a certain type of products and the establishment of the most affordable price.

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	GIF (Australia) = 0.564	ESJI (KZ) = 4.102	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 2.031	

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SECTION 21. Pedagogy. Psychology. Innovations in the field of education.

THE RELATIONSHIP OF THE NATIONAL CHARACTER WITH CUSTOMS AND TRADITIONS

Abstract: *At this story national character taking shape and become developed self control system and customs and traditions with tied about idea used.*

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Introduction

Nowadays, nations are facing, such unprecedented conflicts – economical, political, globalization of cultural relationship, formation of certain standards in every field of life, extremism under the mask of religion, is endangering the values which was formed in the nation for centuries. In this process, the national character as well as the existence of national self-identification is appearing as the motive for maintaining the nation's identity.

Each nation has traditions, rituals and customs that have taken shape, evolved and developed for a long time. They are alive with individuals comprising the nation.

It is evident that as each nation's language, customs, literature, art, and crafts are unique, Uzbek people also have their rich moral heritage as one of the ancient people. Not only should we use our descendants' priceless inheritance, traditions and customs in order to improve our standard of living but also we must utilize them to enrich people's worldview and appeal them to positive features of the national character.

It should be mentioned that manners and customs are social and necessary condition that shapes national appearance and character.

Materials and Methods

Condition is considered to be the collection of the objective factors that are important for things and events to live and improve [5. 32]. If we look at the issue from this perspective, national character is one of the objective customs factors: manners and traditions that is necessary for living and evolving which without nations lose their national identity whilst people lose their moral targets. It is one of the necessities for a nation to exist.

However, national character is a moral trait of a nation which serves to ensure harmony among the members of a nation and continue the stable development strategy.

Similar to other nations, Uzbek people also have such traditions that rebuilding, enriching, modernizing and harmonizing them with moral and scientific procedures can serve to morally enrich the countries' social and cultural life. Because, citizens, especially youth improve the sense of involvement to the state, nation, people's history and future by learning the traditions of their own nations. National traditions and customs are also the source of national worldview. Since ancient times, every generation has developed their worldview by imitating their parents and relatives and handed over the families' traditions and customs to the next generations as inheritance. If we make a conclusion relying on that logical harmony, Uzbekistan is, not only a motherland in terms of location for us, but also Uzbekistan is the land of our Uzbek traditions and customs. For this reason, development of our state, language, morals, history, freedom, and traditions is highly beneficial for us. Because, it is the harsh truth that forming the positive traits of the national character, and the importance of traditions and customs in the development of the nation as well as formation of national identity was ignored, and customs and traditions were considered as religious nonsense,

ancient orthodox during the Soviet Union ruling. "Nowadays, an attempt to bring in western lifestyle and customs as democracy is strengthening because of globalization instead of learning and appreciating the positive aspects of our traditions and customs and this is requiring being even more responsible. Today, the importance of preserving and developing our tradition and customs is three times bigger"[1.6].

Our priority, firstly, is authenticating and improving the customs and traditions whose shape and basis were falsified during the Soviet Union's ruling, secondly, we should protect them from the beliefs of religious extremism and the attacks of some groups which are under the mask of "human rights protectors". For this, we need to preserve and develop our traditions that are significant in our nationality and lead us to unity and harmony. Hence, national character must be enriched with the inheritance of our descendants and traditions. Moreover, our national ideology is requiring exactly this kind of action. If every ideology aims the social and moral unity for certain purposes. However the aim and opportunity have already been achieved in Uzbek mentality. But the problem is about how to use and control it. "If social unification hinders rationalism and individualism in western countries, it is reverse for us, because Uzbek people have been apt to social integration for long [3.109].

Humanitarian principles in traditions have positive impact on the moral sphere of a society and peoples moral identity, national character of the nation. Most importantly, as society develops, its moral system demands changes, too. In this case, "if a person morally develops according to the needs of the society, his or her socialization coverage expands" [4. 229]. This process can be observed in the historical stability and fluctuations of national customs and traditions.

Traditions and customs have taken shape for centuries. They live and evolve. However, the laws existing in the society are changing, traditions and customs as the conditions for the existence of national character come closer or change in relation to the changes in time and place. Only if the conditions which used to be prevailing in the past disappears, the laws existed along with it give their place to the new laws that are suitable. For the new conditions, in certain case if conditions lived in the past are not more convenient, old laws keep their action. But its functioning field is limited, and finally, in certain situations. If old conditions are much more convenient, there will be wide prospects for appearance of laws [5.32].

It is not secret that, during the Soviet Union's, ruling there were considerable attempts against national republics' traditions and customs under the ideology of forming unique soviet personality. This situation, in its place, undoubtedly affected prevailing national characteristics. As a result, some traditions that had been existing for thousands of years in the life style of Uzbek people were changed or forgotten.

Apparently, the alterations made on the system influenced on the lives of nations and on its basis new conditions and the system of matching traditions took shape. Consequently, some moral qualities that had been considered negative came into life as habits.

"It was necessary to move Russian people to Uzbekistan, to increase the number and influence, and these people were expected to spread the Russian language, customs, traditions, values and lifestyle among our people. The fact that the inhabitants in villages outnumbered in the whole population hindered the way of living from becoming our nation's lifestyle. In big cities, Russian lifestyle and language had already established its dominance"[6.194-195]. According to other source, "Communist regime that eroded Uzbek people's several traditional social systems had to stop in the fight against makhalla. Makhalla was an unexpected social power for communists" [7. 43]. In reality, historians' thoughts about our nation is true. As stated correctly in these descriptions, makhalla was the only place where our traditions, customs and culture could be preserved because of the facts that villagers comprised the majority of the whole population and makhalla system defended them to a certain extent and these factors, without doubt, played a role as safe places for living of nation's attributive character is tics.

Thus, if we differentiate basis and local conditions of law enforcement/ [8], we can add villages and makhallas to basic conditions of national character, traditions and customs can be categorized as local conditions. Although the soviet Union attempted to destroy the national characters of its members, it could not succeed in that plan. Because, nations self controlling systems in the shape of makhalla, village and ovul had evolved for thousand years and they had been fulfilling their functions. If the Soviet Union had succeeded in this plan, it would have been possible that traditions and customs would be gradually forgotten by the nations.

Conclusion

In conclusion, as long as a nation's traditions and customs are proper and colorful, and they are able to respond its life style and all fields of people's lives, that nation lives forever. Because, in the nations social development not only economic factors but also people's worldview that is shaped by everlasting traditions, and customs and stability in the nation's character make base for the development of the belief in the bright future.

Besides, according to the First President I.A.Karimov, crucial and primary factors of the development of a democratic society, in the first

place, stems from the nation's traditions and customs along with its national-historical lifestyle and ideologies [1.40].

Therefore, preserving and enriching our customs and traditions with new social and moral needs and apportunifics strengthens the main core of the national character, clarifies unique traits and qualities of the beauty of the national character.

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SECTION 29. Literature. Folklore. Translation Studies.

ISSUES OF AUTHOR'S PERSONALITY AND LITERAL TEXTURE

Abstract: *Personality of the author is a very difficult concept. Studying of the personality of the author in close interrelation with his works helps to comprehend those challenges, about which we didn't guess earlier. Accotrding to the founder of an autobiographical method Sainte-Beuve: "Any imaginative work is a speaking person, and it is impossible to divide the personality (author) from the work" [16, page 48]. Actually, an imaginative work of the author is the copy of his wordl-view. Article embraces a number of analysis methods. Information on the personality of Navoi are studied on biographic, historical-comparative and analytical methods.*

Key words: *author, personality, literal text, Alisher Navoi, biographic method, imaginative work, hero.*

Language: *English*

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Introduction

There are few authors in the world literature who can attract attention of the reader. Especially, gaining of authority in art and literature promotes changes and development of moral thinking of the nation. It can be seen in literature and life of people of Orient and West. Throughout five centuries Alisher Navoy attracts interest of scientists of the whole world.

Materials and Methods

Unambiguously, great poets as Alisher Navoy don't appear incidentally. First of all, adequate social-cultural environment, economical and political conditions are vital for this purpose. In spite of the fact that Navoi lived in the fifteenth century, he has taken the eternal place in the hearts of people. His creative personality and world-view are closely connected with moral-spiritual values, implemented by Amir Temur. Works of Alisher Navoi are very popular in the world. His books are translated into tens of foreign languages, including Persian, Italian, German, French, Dutch, Hungarian, Czech, Romanian, Polish, Indian, Turkish, English, Russian, Georgian, Azerbaijani, Turkish, Tatar, Ukrainian, Latvian and are repeatedly re-printed. Western travellers and officials staying in East in the 21st century often tried to take out copies of works of Navoi to their homeland. As a result, museums, libraries and private collections of Great Britain, France, Germany, Italy gathered a number of works of Navoi. It This was mentioned in 1888 by English orientalist Ch.Riyo, at time of describing his catalogue in London (13, 273) European orientalists E.Bloshe, M.Buvat and E.Brown studied the personality of Navoi on the basis of his manuscripts (5, 505). Thus, since 21 century interest of European and Russian orientalists to the personality of the great poet had increased (2; 18; 15; 10; 11; 14).

By the beginning of 21 century certain generation, which studied creativity and scientific heritage of Navoi had been shaped in the world. Such scientists as David de Vis, Bert Fragner, Kazauki Kubo, Mark Toutant, Alexander Popas, Nicholas Vomsley have conducted a number of researches on scientific heritage of Navoi, took part in international grant projects and propagandized activities of the great poet worldwide. Kazauki Kubo, professor of Kyoto University of Japan conducted a number of observations and researches on life and creativity of Alisher Navoi.

Kubo Kazauki has carefully studied a sphere, which was un-captured by the researchers of Navoi - he analyzed activity of Navoi as a sponsor. Japanese scientist has emphasized humanity and generosity of the great poet. In his work "Sponsorship of Navoi" Japanese scientist has studied sponsorship of the poet, based on such works as "Makorim ul-akhlok", " Badoe al-vakoye", Baburnama, "Tarikhi Rashidi" and "Vakfiya". On the basis of various sources

Kazauki Kubo could also define names of a great number of officials, who worked in Herat under the auspices of Navoi. Among them there were writers, calligraphers, musicians, artists - Navoi provided material and moral support to all of them.

According to Kubo, 11 people worked in private library of Navoi. Such interest and passion to Navoi's activity promoted development of separate science – Navoilogy.

By the way, in order that a literature can be shown in all its beauty – it requires social tranquility, economic stability and political freedom. Particularly, political unfreedom, ideological prosecutions complicate a creative path of authors. Thus, Husain Boykaro, who was in power for 38 years, was a close friend of Alisher Navoi sponsored him and played a significant role in his creativity. Similar to Amir Timur's role in Mirzo Ulugbek's destiny, Husain Boykaro has influenced Alisher Navoi creativity. Governance implemented at Timurides always inspired Alisher Navoi.

None of religion, sects, education or philosophy can not indicate on humiliation and insultence of humanity. Unfortunately, despite of that, it is possible to notice worldwide violations of human rights, utilization of people in slavery conditions. Injustice and violence doesn't recognize any religion, nation and races. And struggle against it by a feather evil ennobles an author. Alisher Navoy is also considered to be one of those devoted his life and creativity to this struggle. Fair government, love to people, continuous protection of interests was the main motive of his creativity. The main idea of each his work was appeal of Shah to conscience, justice and protection of interests of the people. According to historical data, Navoi by his nature was quiet, balanced, generous and fair person and this was reflected in essence of his creativity (1; 6; 8; 3). It can be seen in "Matlai sa'dan" by Samarkandiy, "Ravza us-safo" of Mirkhond, "Makorim ul-akhlok" by Hondamir.

Amir Nizommiddin Alisher Navoi (1441-1501) is world renowned and has a status of outstanding Turkic poet, thinker and philosopher. His works are added to a treasury of world literature which promoted development of science, arts in the second half of the 15th century at Timurids.

Long-term experience in governing and rich cultural heritage have been destroyed during Mugul invasion. In this regard revival of history and philosophy of the Turkic people was very difficult. Even efforts by Timurids on recognition of Turkic language as a State language hasn't been carried out up to the end. Navoi has managed to revive Turkic (Uzbek) language in the world of literature and could organize office-work in the state in one language. Alisher Navoi has finished up the work which Timur couldn't carry out, he managed to elevate the status of Turkic language to the state language.

Majesty and merit of Alisher Navoi in the history of nation are measured not only by the fact that he was a great poet only. As great he was in poetry, so developed he was in science. Still his works in the field of linguistics, history and sufism such as "Muhokamatul-ul-lug'atayn" (Studying of language) "," Mezonul ul-avzon" (weight) and "Nasoyim-ul-mukhabbat" (Love wind) are not analyzed completely. Greatness and personality of Alisher Navoi, his style had strongly differed from coeval writers. His ability to inform a reader on sincere passion of the hero, manifestation of godlike power in soul of the hero strongly differed him from others. It would not also be exaggeration if we tell that these distinctions have provided greatness to Navoi.

Any work of art is an inner world of the author, a spiritual kingdom, an independent state. This state has own culture, laws, orders and the principles. As the work of art is a certain state, naturally, it will have the territory and borders. And atyle used by the author, symbolical designations and metaphorical means are peculiar "lock" of this state. As soon as the reader correctly understands used "trick" and finds keys to conditional "lock" - only then work crosses its conditional border.

In most cases, reading any work we think of a plot, its heroes, we analyze and we criticize, but for some reason we forget about the personality of the author and his life. Writer is also a personality, alive-being, biological and social component. Studying essence of works of Navoi, we notice versatile shades of personal experiences of the author in them. In particular, scientists have noted that we can evidence similarity between the hero prince Farrukh and the poet in the dastan "Sa'bai-sayyor". In this regard spiritual worry in works often coincide with personal moods of the poet" (9, 71). Having learned that Farrukh's beloved is also loved by his close friend, the prince refuses his love and decides to live his life alone. Such desperate gesture remains unnoticed by his friend. On the basis of such small details we can clear up some unknown moments of life of Navoi in regards of his marriage.

French scientist P.Valerie noted that "value of the literary text consists in ability to interpret each hero separately". "The text is a double system of a language created by an author" (12,122). Eventually, it is necessary to consider psychology of the author behind each used word. For the due analysis of works of Alisher Navoi, they should be studied in a compartment with the period of life of the author. Main base of the literary text is a word. Navoi divided the word into two types - prose and poetry. Traditionally he put poetry (poems) above the prose. Because prose – is a chaotically combination of words, and poetry –ordered combination. The same was followed by Nizamy as well. Navoi supported efforts of Nizamy and promoted further development

of his potential. Husrav Dekhlavy didn't consider the word as a backbone of the literary work. In this regard hence there is no uniform opinion on prose and poetry.

In "Hayrat-ul-Abror" Navoi had also put forward a number of theses concerning a role of a word. 1) definition of human aspect; 2) detection of moral qualities of a person; 3) establishment of advantages of poetry in prose. Knowing peculiar specifics of prose, and realizing ample opportunities concerning poetry, unambiguously, Navoi referred to prose for expression of a certain context and purpose. Speaking about a person, Navoi notes that a person differs from an animal by his ability to speak, however, it is not possible to call each speaking human-kind a person. He writes that the main symbol of mankind is a belief, i.e., conscience. Navoi noted that the word has to be used for good, noble purpose and if the word is used for evil motives, it can cause disaster, and a person using words in this purpose is not a Muslim. Spiritual wealth, morality, education is the main traits of Naoi's character which made a backbone of his works.

Navoi has such saying: "Though most of people have appearance of the person, most of them has no humanity... It is not necessary to be surprised of that. In any city there are few people, both physically and spiritually, worth this honor. Others, notwithstanding apperance, are deprived of this status". Conspirancy, gossips, violence - all these acts are made by means of the word. By means of words people use various ways for evil acts. The word has a magic force, both to kill and to revive a person. Word can destroy or prosper a country, word can revive great causes and also can serve origination of crimes. For this reason, poet constantly emphasizes a need for care and importance for selection of words.

Navoi considers that achievements of a person, first of all, depend on himself. Id est, if the person could subordinate the greed - a basis of negative virtures, he can follow a way to perfection though this way will not be easy. Therefore, bravery for Navoi is not a victory over a lion in a cage, but restraint of the greed living within the person.

The first prosaic works of Navoi "Hamsat ul-mutahayyirin", "Holoti Pakhlavon Muhammad", "Holoti Sayeed Hasan Ardasher" have been ordered in Turkic language in which, besides description of the personality of outstanding scientific contemporaries such as Zhamy, Pakhlavon Mukahmmad, Sayeed Hassan Ardasher, poet lays initial foundations to the styles of prose. Navoi colourfully shows his ability to reveal a personality. Common feature, uniting these works, is creation in the spirit of Orient Renaissance. In "Holoti Sayiid Ardasher" there are such words - "Officialism is alike alcoholism. However it differs from wine dependence. Drunk person can not control his words and acts. As a result, he can offend people, can make silly acts. After sobering up people repent from their actions. However such repentance lasts one day or certain time. And alcoholism of officialism lasts consequent staying in a designation. If a person controls his deeds after appointment - it is good and if he loses a sense of reality, then it can end deplorable, he can make many foolish deeds". In due time Navoi worked in high designations, nevertheless, it never stopped him thinking about people and wellbeing of the country and nation. He always fulfilled his duties honestly and frankly. The allocated ideology of all works of Navoi always distinguished him from other writers. Navoi served people with not his works only, he implmented practical deeds.

Fact that Navoi had unusual talent can be proved when comparing with outstanding poets of the world. If Firdausi has written "Shakhnama" in 30 years, Nizamy his "Hamsa" in Azerbaijani language in 30 years, Husrav Dehlaviy his "Hamsa" in 6-7 years, Navoi writes "Hamsa" in 2 years. According to historical data, Hussein Boyqaro noted that a royal work of Navoi had been written in only 6 months.

While serving in high position at Husayna Boykaro, Timurid dynasty, Navoi served as an counsellor to the Shah (King) in fair and honest government. When he ruled Astrabod, he has made efforts in development and prosperity of the city and always acted fairly. By character Navoi would not be compared in love and mercy, generosity and modesty. This can be proved by dozens of examples in "Makorim ul-azlok" of Hondamir. Facts that Navoi always compared himself to "earth", his generosity with prisoners, even his attitude towards ants hooked to his clothes - he always carried them to their hill - all this is described in Hondamir's work. When Navoi is appointed to a high position at the Palace, stamping ceremony was carried out. On this event, being a main Amir (minister), Navoi signs the document at the very bottom of paper where it is impossible to put a seal - it demonstrates his extraordinary modesty and humanity.

Alisher Navoi was owner of huge territories. In 1481 he gives up his lands – hands over the property and creates a charitable fundation. Income from the property - buildings in Hirat, Ikhlosiya madrasah, 24 shops, 3-4 markets and huge acreage has been directed to educational institutions, inns for wandering and dervishes, to pilgrims, for satisfaction of needs of poor, orphans and persons in need. Main part of the income had been aimed to the development of science and literature. It is historically proved that tens of scientists have been completely involved in the scientific activity by material support of Navoi. A special attention was paid to the people writing historical books and fine arts masters. Under the personal initiative and personal assets of Navoi Halosiya, Shifoiya and Nizomiya madrasahs were constructed in Heart,

where famous scientists have delivered lectures. All his life Navoi cared for the welfare of people and it is considered tobe one of those writers, who have devoted life to this. Special reservoirs for the people needing water have been biult under his supervision, 16 bridges and 2 flood dams were built – all these constructions served for the welfare of simple people.

Mahomed Haidar in his "Tarikhiy Rasheed" notes generosity of Navoi to people of science and art - "Due to efforts of Navoi outstanding scientists appeared from among simple during this period. Having saved huge wealth, he allocated funds for the needs of people as charity with no hesitation. As per his abilities Navoi assisted persons in need and scientist. Income from property he had spent for charity for the benfit of the country. About sense of his life Navoi writes: "I have seen many difficulties, but the most difficult was to fulfill a civil duty – that is the hardest work - a sense of responsibility in front of the people and nobody has the right to forget about it".

Harry Dick, Canadian scientist studying creativity of Alisher Navoi writes that "We need real artists for upbringing of the nation… True development does not happen from outside, it exists in the hearts of people. We are in need, we dream that such poets as Navoi would speak in our language, from whom we could learn much and take example".

A.Navoi was not only a poet, he also was an outstanding politician and philosopher of his period. As a historian Alisher Navoi has written such works as "Tarikhi mulki azham" (History of Persian Shahs) and "Tarikhi anbiyo va hukamo". In his religiously motivated works as "Nasoyim ul-mukhabbat", "Vakfiya", "Qirq Hadis" (Forty Hadis), "Munshaot", etc. he described various spheres of social political issues of his time.

In his "Majolis un-nafois" Alisher Navoi tells about 459 people of various professions, who were engaged in creativity, and carried out analysis of positive and negative aspects of their works. Navoi's "Mukhokamat ul lagatayn" serves as a proof of a role and contribution of the poet to the literature and development of cultural life of people of that time. Except all, this work is a bright heritage of scientific prose of Alisher Navoi. In "Mukhokamat il lagatayn" Navoi repeatedly emphasizes that this work is made on background of rich traditions of works in ancient Uzbek and Persian languages.

It is not a secret that some unresolved questions in the science were the reason that the personality of the author remains still un-studied. Studying author's personality in literature had been started in Europe in the first half of the last century. At the same time, as we speak about author's personality, it will not be superfluous to pay attention to a truth in regards to author's personality, since each author has personal character. So far, carrying out parallels between a work and a personality of an author was not encountered. Another fact that one of the main problems in navoilogy – is studying of creativity of authors of other nation and religion on the basis of own views and principles.

It is proved today that studying of creativity of Navoi by Russian scientists Bartold and Bertels have been carried out unilaterally, separately from the author and life period, which resulted corresponding conclusions. It is obvious that writers express their opinions in works. Id est literal text serves as a bridge between the author and a reader. Behind each *satr* and *misra* (sentence) of Navoi there are poet's condition and mood of the people – and one should not ignore it. It is expedient to remember research of the British scientist R. Nicolson *"Tasavvufda ilokhiy shakhsiyat*" (Sacred personality in Sufism). Topics devoted to Mansur Halloj, Gazzoliy and Rumiy awaken discussions among readers. Muslim scientist Afify, who has written a preface to this book, having seen as "author combines efforts and concept of personality based on Christian belief and tries to find alternative in Sufism. However, there is a big difference between Christian points of view and Islamic". It is impossible to forget that we faced insufficient attention towards works, which stipulate unity of Alisher Navoi's personality and views of his heroes. It is important to note that it is an actual task for scientists - Navoilogists.

Artistic image is a self-expression by means of other person. A writer is in the relation with the image on the basis of his temperament, character, nationality and esthetics. As multi-sided and full will be a author's personality, so his heroes will be complicated in character. Besides that creation of true character is managed by free, honest and internally unite authors. Life and sociaty approach will be enough for such author. And he will have a apprehension towards his time. The ideal character can be created by spiritually full, physically free, spiritually steady and religiously stable author. Due to his outstanding qualities, Alisher Navoi could create his great works. And his awesome and bright heroes are peculiar "sparkles" and "I"s of the author.

Content of a difficult work can be compared to a nature. The analysis of texts indicates the mastered skills of Alisher Navoi in the field of science. When we talk about poetic analysis, mostly ideology and discussion of sense, moderation, rhymes and art is generally understood. As the real analysis and interpretation demands judgment of interrelation of all components of work - sounds, accords, colourness and sense with condition and passion of author. Eventually, it is time proved that the atmosphere of time, condition of the period, passions of the society also influence the author, that is undoubtedly, is reflected in his works. Writers of the East show the world of passions by means of main characters.

Esthetically ideal perfect hero of Alisher Navoi, first of all, consists of aspiration of the author to find own "I" in life.

Basing from the mentality and world-view, poet loads a literal sense and idea to his heroes. Imaginative characters - are reflection of author's "I", his ideological model, which reflects dreams and experiences of the author. Author's "I" has got more complicated structure than we think of it. Nation language, belief, values, traditions and customs of the personality of the author are reflected in him. We shouldn't forget that *" biographers consider that the personality of the ordinary-looking author can not showcase his "I", in this regard history estimates only his work" (16, 48). Actually, key to understanding an essence of the work is author's life and destiny (4,356).*

Conclusion

Esthetic ideal is considered to be a historical category and every period has its own ideal. Esthetic ideal is an association of an esthetic and artistic tact of author, his dreams and desires.

Each reader understands, realizes, feels and interprets an inner world of Alisher Navoi on the basis of own opportunities and apprehensions. In this regard, unique creations of the great poet and philosopher Alisher Navoi for centuries deliver spiritual pleasure, moral happiness, mind knowledge to the readers and also serve as a sacred astonichment and moral requirement.

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SECTION 5. Innovative technologies in science.

FORESIGHT TECHNOLOGY IN MODERN SCIENCE DEVELOPMENT

Abstract*: The article deals with the foresight technology study as not just the study of the future, but also a set of approaches to decision-making with the aim of improving the factors affecting the future in the long run, and creating broad social networks to form the desired or expected future in modern conditions of technical and informational revolution.*

Key words*: foresight, science, technology, approaches.*

Language*: English*

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Introduction

Over the last 300 years the role of science has radically changed. From aristocratic occupation, akin to a hobby, inquisitive units, scientific research has become a mass occupation, the profession of millions. Science has become the starting point and source of technological progress. And technology, based on scientific knowledge, has become the basis of production. In the twentieth century, the revolution of technology came to replace the scientific revolution.

In the second half of the twentieth century, the economy began to turn into a knowledge economy, and developed societies into so-called knowledge societies. The success of modern societies has become less dependent on the size of the country's territory or population, and increasingly on its innovative development and innovative activity, on the realization of knowledge in production and human potential. To maintain high competitive advantages and sustainable development, successful societies need a high rate of innovation. And innovations are not only new products, methods and organization of their production, but also new services.

In the context of globalization, social and economic evolution in general, and the development of the knowledge society in particular, are accelerating significantly, which gives additional opportunities for development to the level of highly developed societies. In such conditions the role of the decisions made today and their price for the future are significantly increasing. It is important to understand the vector of development and long-term social and economic, scientific and technological, humanitarian and environmental context.

For the effective development and reasonable distribution of public potential and resources, various approaches and methods are used to understand, foresee and shape the future, to determine the goals and development trends, the tasks of management and ways to achieve these objectives. Over the past 50 (and especially last 15) years, foresight has spread widely and developed significantly.

For the justification of strategic and even tactical solutions, in conditions of rapidly changing public practice, forecasting and especially foresight research is widely used. In fact, they are becoming almost the most effective instruments of scientific, technological and innovation policy in the context of globalization.

It is known that foresight research is not identical to forecasts, which were made 50 and even 30 years ago. In general, futures studies were formed as the most complete set of prediction methods. They include the study and consideration of the most important trends and factors, as well as the identification of the main interests and the analysis of combination of different forces with the aim of determining the alternatives for the future development to a much greater extent than making only the forecast of the future. Futures studies are heavily influenced by such problems as ecology,

human health, new technologies, i.e., have an unconditional social orientation [1].

The term *foresight* began to be actively used since the late 1980s. This term means not only the study of the future, but also a set of approaches to decision-making with the aim of improving the factors affecting the future in the long run, and creating broad social networks to form the desired or expected future. In this sense, the interpretation of foresight as a social technology that outlines the direction and ways of shaping the future and requires discussion of options for the development of this future and scenarios by its various social groups, forces (or agents, as they are called) is justified.

These approaches to making decisions to determine and achieve the expected future have the following objectives:

- gather key social agents of change and sources of knowledge;
- these agents are gathered together to develop a strategic vision and forecast for the future;
- the focus is on long-term social, economic and technological development;
- the formal output of the work may include scenarios, action plans, priority lists;
- however, the foresight process, especially in the area of creating links between people, should help to create a common vision for the future, an overall picture of the future.

It is known that foresight concerns various spheres of social activity and differs in the subject and richness of the methods used and needed to study this subject. Foresight can be divided into classes:

- in terms of problem coverage: global, national, local, etc;
- in the spheres of foresight: social, economic, political, scientific, technological, educational, etc;
- at different levels within the investigated spheres, for example, within the economic sphere it is sectoral, cluster, corporate, etc.

Of course, a combination of several types of foresight is possible depending on the goals and objectives of the study.

Foresight is different in terms of a time lag coverage, or a time horizon: it can be medium- or long-term, but it is very important; rather, it should be phased and be monitored.

Various methods are used to implement foresight:

- brainstorming of experts,
- creating and developing scenarios,
- the Delphi method,
- SWOT analysis,
- alternative options,
- international comparisons, etc.

It should be emphasized, that a quality foresight, especially at the national and global levels, involves the use of a whole variety of methods, rather than one or two of them: the picture will not be complete enough.

In modern world, foresight is becoming a widespread policy tool, especially in science, technology and innovation, but not only. The most global foresight on the goals, tasks and level of problems studied is implemented by the American Council of the United Nations University in the framework of the Millennium Project, launched in 1996.

Of course, this type of predictive global research did not come about by chance. Back in the 1970s, intellectuals, united in the Club of Rome, analyzed the global problems facing humanity as a whole, trying to see their future solution. But then there were not so many different methods of foresight of the future, like the modern ones. Therefore, long-term forecasts were mostly futurological, often alarmist in nature.

The organization of the Millennium Project differs from its predecessors. The project experts analyze the main problems of the present, facing humanity as a whole and individual sub-regions and countries. For this, various methods are used - the Delphi method, the construction of development scenarios, the development of own indicators of the future state, etc. The project organizers managed to gather a huge team of experts under the leadership of strong leaders with the help of approved, well-developed methods of collecting, processing information and its qualitative analysis.

Annually within 10 years the next volume of the report of the Millennium project "State of the Future" was published. It is interesting to note that since 1999, in the key terms used in these reports, "issues and opportunities" to the notion of "problems and opportunities for solutions" the concept of "challenge" was added, i.e. *Challenge* has become a binary concept, synthesis, or removal of problems and solutions. After all, reality is formed or, it is better to say, is corrected by the combined influence of both [2 – 4]. So it was recorded that the adequacy and depth of the decision, and ultimately the formation of reality, depends on the accuracy and quality of problems understanding. Thus, foresight has not only analytical and methodological significance, but also technological, which many researchers in the world pay attention to [4].

Millenium project experts identify 15 world problems, including:

- achieving sustainable development,
- balanced growth of the world's population,
- providing people with water, food and fuel,
- combating old and new diseases,
- free access to information and development of information and communication technologies,
- strategies development,
- not giving freedom to terrorism and ethnic conflicts, the criminal world,

- social freedom of women,
- development of democracy,
- development of effective political decisions,
- harmonious relations between rirodoy and society,
- a new global ethics etc [2].

When discussing these global pressing problems of mankind and the planet as a whole, many decisions rest on the development and application of modern technologies. However, the scientific and technological foresight is being developed for the long-term perspective up to 2025, 2050 within the framework of this project, including scenarios. For example:

1. Science and technology develop their own way of life;
2. The world awakens;
3. Open the gates about the dangers of irresponsible development and the application of science;
4. Negative reaction of the whole population in relation to science [3].

Such an approach rather cautions both excessive kindness and technocratic approaches to science and life. It has other tasks – the definition of the social significance of scientific and technological progress with a view to achieving sustainable development in the world and individual subregions and countries.

In all developed and in many developing countries, strategic planning of priority areas of research, development and innovation is carried out. National plans and projects for the development of science and technology are being formed. Taking into account the fact that technologies strongly influence not only production, which is important in itself, as it changes the character and productivity of labor, it requires qualitative special education and skills, etc., but their influence is more extensive.

Technologies affect both nature and society and individuals in domestic sphere, in healthcare, in the sphere of communication and leisure, etc. in general, on the conditions of work and life. The spread and influence of technology on the life of man and society is strengthened by the development of globalization, the rapid spread of technology and their successful applications in all major spheres of life.

Foresight at the present stage of its development, as a rule, increasingly includes a social context that takes into account demographic and geographical changes, cultural and political changes, forms of economic organizations and other factors. The problem that often arises in scientific and technological forecasts is that they only take into account the importance of broader economic, social and cultural factors. Meanwhile, one of the conditions for these forecasts fulfillment is the social factor.

It was mentioned that foresight can be applied to social, political and cultural problems. But even if foresight is aimed at scientific and technological issues, it will be different from simply predicting the development of technology. The vision of the future in the long term is of scientific interest and has practical significance – it allows to take into account the impact on the future state of today's actions that may have a delayed effect in time and have a series of risks. Thus, power stations and roads should be built taking into account future changes in requests, and teachers for future generations will learn today. Tomorrow's scientists and intellectual leaders are trained and educated today. And the idea of where people live and how they work and spend their leisure affects the development of cities, service systems, etc.

Attention to innovations in the foresight process can solve the problem of choosing priorities and thus determine the further path of social development. Social goals and social innovations, such as new approaches to caring for different social strata and groups, especially those that are weakened, new ways of organizing the workplace and time, methods and channels for the regulation and coordination of employment, etc. should be taken into account. The vision of the future can be useful for citizens who make their choice of a way of life, profession on the basis of ideas about the future.

Some groups of people, especially socially active groups, can make a more complete and well-grounded opinion about the future in the process of communication and exchange of information with other foresight participants. This will greatly help them in developing a strategy for living, behaving and doing business.

Globalization develops and spreads, becoming more and more real and inevitable. It is globalization that creates the main social and structural challenges for societies nowadays. World economic systems are associated with trade, investment, financial flows and well-educated people, who are now more mobile than ever. The rapid expansion of globalization literally transfers North America, Europe and other subregions to an increasingly boundless area with great opportunities and strong challenges.

Below we will consider some of the main trends identified in various reports of foresight [2 –10]:

- ❖ Competition is no longer connected with national borders, as it was before. Instead, successful local, regional or sectoral environments compete with each other, regardless of national identity. Local firms invest and trade globally, i.e. for them there are literally no boundaries.
- ❖ Vital energy supplies for a large part of the developed and developing world are carried out from outside, from abroad.

- Technologies are mainly developed at the global level, most often they do not have their own country of origin.
- The impact of globalization is also felt within societies; there is an ever more acute sense of "tension lines" between the approaches of different cultures, population groups and political forces that must and are compelled to find consensus on vital issues. In these processes – finding consent and joint acceptable solutions – a new global ethics of humanity is being developed.

And this happens not only at the level of global political, economic or social and cultural organizations like the UN, UNESCO, UNIDO, WTO, VTB, WWF, OECD, EU. This process takes place at the global, sub-regional, national, regional and local levels simultaneously.

Modern people have more free time to travel, see other peoples and cultures. Global patterns of life and culture are being developed more and more, leading to stronger links and associations with global ideas and standards of life, and also to greater diversity within local culture.

For example, Europe as a whole within the expanding European Union becomes ethnically and culturally more diverse, while the global urban lifestyle becomes attractive to younger and older generations in different societies. If at present about 50% of the world's population lives in cities, then by 2020 it is expected that it will reach 80% [2]. Accompanying the process of population urbanization, the individualization and even atomization of communities, the emergence of new social groups and changing values offer new opportunities for the introduction and development of new products and services and provide significant potential for economic growth.

All countries are preparing for the development of the knowledge society, since knowledge has become the most important factor of competitiveness:

- At the national, regional and local levels, it becomes vital in every single company to develop the use of knowledge in various ways.
- Multidisciplinary and co-operational skills will increasingly be key to any industry. At the same time, competition for skills and talent will require the search for new forms of work organization.
- Various foresight studies lead to the conclusion that the demand for competent experts in the future will require the development of the educational system in accordance with the social change and the principle of lifelong learning. The synonym for literacy is the ability to a constant, lifelong learning.

In order to take into account the new challenges of globalization, the knowledge society in an increasing number of countries is carrying out active studies of the future and an analysis of already used and developed approaches.

In the unification and urbanization of the world, in which cities compete with each other to attract domestic investment, local authorities seek to create high-quality, healthy, attractive environments for their citizens, and to attract firms from other places. Virtually all industrial countries compete to create dynamically developing areas. Various reports on future research have identified challenges that will affect regional differences and social security:

- One of the main challenges of the future is the problem of urban congestion with regional concentration of the economy.
- The growth of urban centers and regions will give rise to serious challenges to the capacity of local authorities to provide adequate services such as education and training, social welfare and child welfare services, regional infrastructure, community development and family services, etc.

The main difficulties affecting local solutions in the field of knowledge-intensive industries concern the vital aspects of life: urban cultural and environmental values, regional opportunities, convenient transport communications, high-quality telecommunications systems, and the quality and labor cost. Restoration of the environment, urban restructuring and the healthy functioning of urban centers clearly must become important elements of sustainable economic development and interregional unity throughout the world. Modern civilization is primarily a city civilization.

- There will be a growing need for the development and concentration of high-quality interdisciplinary expertise in regions in order to maintain the necessary level of education, health and industry centers.

But the development of technologies and innovations, which are the basis of economic progress and globalization of the modern world, in the projection for the future will require not only changes in the basic spheres of people's livelihoods – labor, life reproduction and basic life resources, communication and leisure. They concern not only the economy, but also politics, law, etc. The values and patterns of activity and behavior that will require legislative changes in relation to information, climate, human health, etc. are changing and will change.

The development of information and communication technologies (ICT) as an important part of the modern technological revolution, the development of the knowledge society, especially accelerated with the advent of the Internet and digital solutions. According to foresight studies [2 – 10], ICT will continue to have a critical impact on the development of all industries and social sectors. The digital revolution, with its new communications and

information technology, is changing society and ways of life.

❖ A special problem in this area is the security of ICT systems and the confidentiality of information. This affects the competitiveness and success of the business.

❖ There will be a growing need for human resources, capable of adapting and adapting new technologies in the economy and society in general. There will be a growing need for continuous and direct training.

❖ There will also be a strong need for a developed technological infrastructure. Mobile communication, broadband, electronic services, embedded systems, artificial intelligence, cognitive science, microsystems, electronic or intellectual paper, sensors and the semantic network and nanotechnologies are also mentioned in various forms of foresight among the components that form the infrastructure of the future.

Another important block of problems included in a socially-oriented foresight, whether scientific, technological, innovative, global, national or regional foresight – is the problems of the environment and climate. Attention to environmental aspects of existence requires significant changes in products, services, methods and processes of production. Such changes will require new technological solutions.

At the same time, new values and goals related to the environment create new business opportunities that can be beneficial for developers of new products and services:

 The sustainability of development is largely determined by the way products and production systems are developed with a prospect for the future. Sustainability is provided by the ways in which production systems and their products are developed, while the ecological aspect, the health of the planet, nature and people becomes very important condition of sustainability.

 Climatic problems are largely related to the production, consumption and conservation of energy, with policy in the energy sector in general. Climate change poses a serious threat to the way of life, the infrastructures that are created in the Western world, and not only there.

At the same time, these challenges serve as a driving force for technological development and the formation of systems and products in order to reduce the impact of people on the climate and possibly manage it.

 The energy problem is acute all over the world, as well as the creation of alternative (oil and natural gas) fuels. This is very important for maintaining sustainable development. It is obvious that control over important natural resources, especially energy resources, can lead to serious regional or global conflicts. This all the more urges us to seek and develop alternatives that are viable and profitable in the long term.

Conclusions

Scientific and technological innovations are often a source of significant economic and social and cultural changes, as it was due to the development of ICT. Thus, the uncertainty of scientific and technological forecasts is quite high, although the precedents of modern top technologies development are taught to be more attentive and far-sighted. As a consequence, it is impossible to accurately identify specific areas of research that will contribute to solving social and economic challenges.

Challenges faced by different countries due to the application of scientific and technological innovations can vary significantly due to traditions, the level of economic and cultural development, the development of human resources, the type of government, etc.

The significance of a call, or a problem that needs to be addressed, can change rapidly, depending on economic, political and even technological influences. The value of the identified call could change in a relatively short time or because of objective events. Therefore, it is difficult to draw general conclusions about the importance of various challenges.

All this is a factor of uncertainty and risk in scientific and technological foresights.

One way or another, both the regional and the national foresight are facing global problems of human development and a technological revolution. And in carrying out these foresights, key application areas such as safety, health, social and cultural life, education, state and regional management, management of trade and services were taken into account. Critical problems encountered in the application of technology were also taken into account. risks that can be grouped into the following classes: hazard to man, danger to culture, danger to management, danger to nature.

The success of development in a globalizing world is facilitated by many mechanisms and tools, especially in decision-making. At the same time, the price of solutions is becoming increasingly high, especially with the acceleration of the rate of development and the diversity of social consequences of modern technologies application.

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SECTION 20. Medicine.

THE STRUCTURE OF PSYCHOPATHOLOGICAL DISORDERS IN PATIENTS WITH POST-SCHIZOPHRENIC DEPRESSION

Abstract: *The psychopathological structure and clinical essence of post-schizophrenic depression in the dynamics of the main schizophrenic disease were determined. The study revealed dissociation between the minor severity of the actual depressive symptoms and subjective patients ' perception of their condition as painful, duration and resistance to ongoing drug therapy.*

Key words: *paranoid schizophrenia, post-schizophrenic depression, psychopathological disorders.*

Language: *English*

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Introduction

In recent years, there has been an increase in the number of depressive disorders both in the population as a whole and among patients undergoing treatment in psychiatric institutions [3, p.34; 4, p. 497; 5, p. 74]. The problem of post-schizophrenic depression is now becoming important [7, p. 295; 10, p. 230; 11, p. 25]. The volume and content of post-schizophrenic depression as an independent diagnostic category both psychopathologically and clinically remain unclear, and their nosological assessment is debatable [1, p. 26; 8, p. 23]. The resolution of these issues is closely connected with the clarification of clinical and psychopathological content of schizophrenia as a nosological unit and improvement of its systematics [2, p. 280; 13, p. 422]. According to different authors, the prevalence of depression among patients with schizophrenia ranges from 25-30% [12, p. 208; 14, p. 38]. It was found that they are associated with such indicators of prognosis as increased suicidal risk, a high probability of recurrence of acute psychotic state, as well as a decrease in adaptive capacity and a lower level of social functioning [6, p. 769; 9, p. 8; 15, p. 431].

The aim of the study was to investigate of psychopathological structure and clinical features of post-schizophrenic depression to determine their place in the dynamics of the main schizophrenic disease.

Material and methods:

The study examined 38 patients with episodic paranoid schizophrenia, who were diagnosed with post-schizophrenic depression during the examination. This depressive condition developed in patients with post-onset schizophrenia and met the diagnostic criteria of "post-schizophrenic depression" (F20.4 MKB-10). In the picture post-schizophrenic depression some schizophrenic symptoms persisted, but leading patients remained depressive disorders that met the description of the depressive episode (F32.) and observed for at least two weeks with post-schizophrenic depression. The average age of the examined persons was 36.1±1.0 years in the whole sample, including 37.5±1.2 years for women and 32.9±1.8 years for men. The maximum number of cases was detected among the age groups 30-39 years and 40-49 years. The study was conducted by clinical-psychopathological and clinical follow-up methods. For a standardized assessment of post-schizophrenic depression conditions, their structures were used psychometric methods of analysis-a scale for assessing Hamilton depression (HAMD) (21 signs) and a subsection of the scale of positive and negative symptoms (PANSS), containing 7 signs of negative disorders.

Results and discussion:

Revealed in the course of research psychopathological features of post-schizophrenic depression, distinguishing these States from the "classical" endogenous depression, manifested in varying degrees of depression. The specificity of the depressive symptoms of post-schizophrenic depression itself was expressed primarily in their incompleteness or, conversely, in their hypertrophy, or coloration of their properties of other disorders. For post-schizophrenic depression characteristic was the sterility of the thymic component, signs of vitality and daily rhythm, the prevalence of apathy, indifference and dysphoric mood. In the clinic of post-schizophrenic depression with the greatest constancy there were motor disorders, which were characterized by either adynamic or asthenic coloration. The manifestations of ideational disorders ranged from a decrease of intellectual productivity, reduce concentration of attention to a distinct thought disorder with elements of depersonalization. Symptoms such as anhedonia, anergia, emotional indifference, social isolation, apathy, thought disorder in some cases, by their nature, were derived depression and their legitimacy was viewed as "secondary" negative disorders (W.Ca pente, 1988), others had more of a primary (deficit) character and were caused by the underlying disease - schizophrenia. In the structure of post-schizophrenic depression, there was a combination of symptoms of depression with schizophrenic disease-related residual psychotic and varying degrees of negative (deficit) disorders. There was a slight dissociation between the severity of the actual depressive symptoms (HAMD scale indices) and subjective patients ' perception of their condition as painful, duration and resistance to ongoing drug therapy.

The average age of the manifestation of episodic paranoid schizophrenia in the sample as a whole was 30.5±1.0 years; somewhat earlier the disease was manifested in men (26.5±1.7 years) than in women (32.2±1.2 years). In this group, hallucinator-paranoid syndrome (75.7%) was detected most often in the clinic of the initial period of the disease. This syndrome was characterized by delusions of physical and mental pressure, mental automatisms, auditory and visual pseudohallucinations. In other cases, in the clinical picture of the manifest attack there were: depressive-delusional syndrome - in 16.5% of cases, delusional — in 6.8 %, polymorphic — in 1.0% of cases.

The study of the typology of depressive syndrome revealed 6 variants, among which apathetic (50,5%, $p<0,001$) prevailed reliably; further in descending order of frequency the following variants were found: alarming (19,4%), simple depression (11,7%), asthenic (8,7%), adynamic (6,8 %) and dysphoric (2,9 %). The average score on the scale of Hamilton's depression was: in women — 18,1±0,9 points, in men -17,8±2,9 points. Significantly more often (68.9 %, $p<0.001$), the symptoms were consistent with moderate depression; severe depression - in 27.2% of cases, mild depression - in 3.9 %.

The study of the clinical picture of post-schizophrenic depression showed that manifestations of "classical" depression were not typical: significantly more often (77.7%, $p<0.001$) atypical syndromes were detected. The sterility of the hypothymical component of depression (38.8%) was manifested by a weak representation of vital disorders, poverty of emotional manifestations, lack of external tension, which did not correspond to the relevance of internal experiences of depression, despair and reflected the discrepancy between the internal (cognitive) and external (behavioral) aspects of the depression syndrome.

The sterility of only the associative component of the triad was manifested in 3.9% of cases and was expressed in the absence of ideatory inhibition. Non-expression of only the motor component of the depressive triad was revealed in 3.9% of cases; it was manifested by the lack of depressive expressiveness in movements, facial expressions, posture. Non-expression of two or three components of a depressive triad simultaneously was detected in 31.1% of cases. In the structure of depressive syndrome, optional symptoms of depression were present in 74.8% of cases ($p<0.001$) in the form of residual delusional experiences (14.6%), hallucinatory symptoms (7.8%), hypochondrial and psychopathic (4.9%), obsessive-phobic and depersonalization (3.9%) and a combination of symptoms of different registers (35.0%). The symptoms recorded using the PANSS scale were presented in the sample as follows: the overall level of positive symptoms "below average"; the negative symptoms reached the level of "average", the general symptoms were "slightly above average". The cluster of depression ($p<0.01$) was at the level of "above average".

The study of negative disorders in patients of the main group showed their presence in all three areas. In the emotional sphere, they reached the level of grade I-II; the analysis of quantitative and qualitative relations showed the predominance of symptoms of "distortion", equivalent to mixed symptoms and symptoms of "loss". Only in 2 (1.9 %) patients negative disorders were equitably pronounced. In the study there was a decline of interest in various aspects of life, difficulties in relationships with others and interpersonal contacts, frequent feeling of inner emotional discomfort, emptiness and failure, irritability towards others, episodes of unreasonable anger.

Objectively revealed poverty facial expressions and gestures, formality in communication, external limitations in the depth of emotional experiences, lack of emotional resonance even when

communicating with loved ones and significant people; inadequacy and grotesque emotions sometimes replaced the mask of indifference. Sometimes emotional failure was manifested by lability, immaturity. In the strong-willed sphere of patients the predominance of symptoms of "loss" reaching I - II rank, appearing in weakness, fatigue, poor portability of former loadings, decrease in volitional activity and productivity due to the volume and quality of the performed functions, is more rare- in reduction of power potential was revealed. In connection with these features, there was a need for external stimulation. The symptoms of "distortion" in the volitional sphere of the patients were found more rarely; they are manifested in motor disorders (disorders of plastics, motor stereotypies, mannerisms), changing patterns of food consumption and sexual activity, etc. In the associative sphere in patients was dominated by changes in I-II grade, almost half of the cases (47,6 %) manifesting symptoms of "distortion" (difficulty and distortion in a personal self-assessment, assessment of the situation, the weakness of internal or external criteria in the cognitive process, the orientation only to the internal criteria).

The study of the ratio of quantitative and qualitative signs in the given spheres revealed the predominance of symptoms of "distortion" in the emotional (42.7%) and associative (47.6%) spheres; symptoms of "loss" (58.3%) prevailed in the volitional sphere.

In the dynamics of the disease, in addition to the growth of negative symptoms, there was a change in the structure of psychological defense mechanisms with a predominance of earlier protections: splitting, in which all external objects were divided into "absolutely good" and "absolutely bad", with sudden transitions from one extreme to another.

In the study of the ratio of post-schizophrenic depression stage schizophrenic process revealed the following distribution: in the anamnesis 1 psychotic attack-61.2% ($p<0.01$), 2 attacks – 14.6%, 3 attacks – 13.0%, 4 attacks – 7.8%, 5 attacks – 1.0%, 7 attacks – 1.0%, 10 attacks – 1.0%.

In the study of the ratio of prescription disease to post-schizophrenic depression, it was revealed that post-schizophrenic depression (80.6%, $p<0.001$) was reliably more often diagnosed in the first decade of episodic paranoid schizophrenia. The average duration from the moment of manifestation to the onset of symptoms of post-schizophrenic depression was 5.6±1.0 years. In 33.0% of cases, signs of post-schizophrenic depression have already taken place in the anamnesis.

The most frequent trigger mechanisms post-schizophrenic depression were mixed (46.6%) and jet-personality (42.7%). In the context of the personality-reactive hypothesis, post-schizophrenic depression was seen as a psychological response to the fact of schizophrenia disease, as its social and psychological consequences progressed, negative emotional experience accumulated, a sense of inferiority, dissatisfaction with oneself and life, self-esteem decreased, despair and hopelessness arose. If reconciliation with the changes did not occur, the depressive position gradually supplanted the ability to perceive life positively.

Consideration of the dynamic characteristics of post-schizophrenic depression showed that the average duration of all newly diagnosed post-schizophrenic depression was 9.9±1.4 weeks, significantly more often (53.4%, $p<0.05$) they developed as an independent affective attack; post-psychotic depression was recorded in 37.9% of cases. In most cases (79.6%, $p<0.01$) post-schizophrenic depression proceeded recursively; thus dynamics "by cliche type" (52.4%, $p<0.01$) was reliably observed more often. Recurrence of depressive symptoms occurred both under the influence of psychogenic and somatogenic hazards and autochthonous.

Conclusions:

Post-schizophrenic depression was significantly more common in the presence of 1-4 psychotic episodes in the anamnesis (97.1%) and the state of the disease with episodic paranoid schizophrenia up to 10 years (80.6%). Clinical manifestations of post-schizophrenic depression significantly more often (68.9%, $p<0.001$) correspond to moderate severity of the disorder; severe depression observed in 27.2 %, mild depression - in 3.9%. The average duration of the first detected depressive episode was 9.9±1.4 weeks. In 79.6% of cases ($p<0.01$) post-schizophrenic depression was recurrent.

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SECTION 20. Medicine.

CHARACTER TRAITS AND COPING STRATEGIES IN TEENAGERS WITH MENTAL RETARDATION

Abstract: *In order to identify the characteristics of teenagers with mental retardation and determine the characteristic coping strategies, 32 teenagers with mild mental retardation of 14-18 years were examined by clinical psychopathological method. The interrelationships of psychological protection mechanisms, conscious coping strategies and behavioural characteristics of teenagers with mental retardation indicate the complex impact of psychological protection on the socio-psychological adaptation of these teenagers.*

Key words: *teenagers, mental retardation, coping strategies*
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Introduction

The problem of development, education and upbringing of children and teenagers with mental retardation is one of the most important problems of our time. Numerous researchers have expanded the understanding of the structure of mental disorders of mentally retarded teenagers and their adaptive capabilities [6, p. 310; 9, p. 26].

From clinical and psychopathological positions, mental retardation is considered as one of the variants of dysontogenesis, in which the main manifestations are violations of cognitive activity, emotional, volitional, motivational spheres and personal immaturity.

A mentally retarded child is constantly in a situation where adverse socio-psychological factors can interact with dysfunctional biological soil [3, 390]. In order to cope with external and internal conflicts, the ability to resist mental disorganization and behavior, to be able to avoid tension, children and adolescents with mental retardation are forced to use psychological protection more intensively in their behavior.

Psychological protection mechanisms operate in the daily experience of children and adolescents, allowing them to resolve internal and external conflicts and to combat anxiety. In situations of psychological threat, they also use a variety of coping strategies. Each of the many behavioral, emotional and intellectual coping strategies of the individual can be considered not only as a conscious variant of psychological protection, but also include several such strategies [2, p. 122; 4, p. 1222].

The behavior of the mentally retarded child, as well as normal, is associated with the characterological characteristics of his personality. One of the mechanisms of adaptation of a person to changing social conditions is coping behavior, which requires special efforts from him / her and the manifestation of imperceptible personal qualities [3, p. 11].

Coping behavior strategies (coping behavior) are determined not only by the age factor, but also by the peculiarities of the child's mental (mental, personal and emotional) development. Intellectual insufficiency of varying degrees is a group of different variants of deviations in the structure of intelligence and the formation of certain aspects of the psyche that hinder the adaptive capabilities of children and adolescents. When intellectual development is disturbed, the coping behavior process fails at the stage of the “primary assessment” – a cognitive process with emotional components [8, p. 161].

Coping behavior of mentally retarded teenagers with problematic situations determines to a large extent the effectiveness of their social and psychological adaptation to changing living conditions [1, p. 2907; 5, p. 1003].

In the event of negative, psychotraumatic experiences, when there is a need to cope with emotional stress, a person resorts not only to conscious, but also unconscious activity of his psyche in the elimination of emotional discomfort involved unconscious mechanisms of psychological protection, allowing to balance the internal state of a person and stabilize his behavior [10, p. 516; 11, p. 80].

In this regard, it is important to study the psychological protection of mentally retarded adolescents with different types of character accentuations that determine the development of protective behavior options that lead to adaptation or disadaptation of such adolescents. This will improve the processes of their medical and psychological support and socio-psychological adaptation.

The aim of the study was to identify the characteristics of teenagers with mental retardation and to determine the characteristic coping strategies.

Material and methods:

The study surveyed 32 of a teenager with mild mental retardation aged between 14-18. Were used clinical-psychopathological method, patoharakterologik diagnostic questionnaire (PDO) for adolescents (A.E. Lichko, N.I. Ivanov, 1994); a questionnaire of coping strategies of school-age SCSI, adapted N.A.Sirota and V.M.Yaltonskiy (1994).

Results and discussion:

The study revealed 15 types of character accentuations, with the most common epileptoid (42.4 %), epileptoid-hysteroid (18.2%), hysteroid (7.6%) and schizoid-epileptoid (7.6%). In the study of character types we studied some behavioral characteristics of adolescents. Thus, the reaction of emancipation, the possibility of forming psychopathies, the risk of suicide attempts were revealed, and their indicators of the risks of social disadaptation and early sexual life in adolescent girls were increased.

It can be assumed that, performing an adaptive function in the inner world of a teenager with mental retardation, accentuated traits at the same time often cause his disadaptation to the people around him, the environment and living conditions. They are due to the innate properties of the nervous system, intellectual underdevelopment and peculiarities of the emotional and volitional sphere, as well as social factors and, first of all, disadvantages of education.

Found that mentally retarded adolescents with hyperthymic, sensitive, epileptoid, schizoid-hysteroid accentuations of character represent an increased risk for the occurrence of behavioral disturbances.

The study of coping strategies used by adolescents with mental retardation in unpleasant situations showed that the most significant tense situations for adolescents with mental retardation are: “there were such situations, but now I do not remember” (25.8%), “quarrel with relatives” (17.7%), “quarrel with a friend” (11.3%), “fear of physical threat from” (11.3%).

Teenagers with mental retardation in tense situations resort to the use of coping “entertainment and physical relaxation”, i.e. use behavioral ways of coping with the conflict.

It should be noted that the implementation of the problem-solving strategy requires sufficiently developed thinking. In adolescents with mental retardation, this coping takes 3rd place for use. Behavioral strategy “Privacy, avoidance” is actively used in the study group. It is established that groups of kopings relating to “aggression” and “expression of emotions” are expressed in the least degree. In addition, the greatest number of coping strategies was revealed in mentally retarded adolescents with labile, sensitively schizoid types of character accentuations.

The analysis of the study of the effectiveness of strategies showed that mentally retarded adolescents most of all help to cope with the anxiety of “entertainment and physical relaxation” (19.4%), “search for social support” (17%).

A lower percentage of the effectiveness of the “seeking social support” strategy in the pilot group should be noted. Perhaps this is due to the fact that adolescents with mental retardation can not always count on the help of people around them, especially from the family. This feature is noted in the list of causes of unpleasant situations where “quarrel with relatives” ranks first among adolescents with mental retardation.

In the study of the strategy of protective behavior, characteristic of representatives of different types of accentuations of character, it is shown that in mentally retarded adolescents with hyperthymic, schizoid, epileptoid, hysteroid, epileptoid-hysteroid accentuations protective behavior is aimed at “entertainment and physical relaxation”.

For mentally retarded adolescents with unstable, sensitive, sensitive-schizoid, labile-sensitive, labile-hysteroid accents characterized by “relief of the soul, problem-solving planning” in difficult situations.

Labile adolescents with mental retardation use the strategy “search of social support” and “entertainment and physical activity”, astheno-neurotic teenagers - strategies “relief of the soul, the planning problem-solving” and “search of social support”, schizoid adolescents strategy “solitude avoidance”, labile-cycloid – “search of social support”, schizoid-hysteroid strategies “expression of emotions”, “search of social support”, “entertainment and physical activity”.

Coping behavior of adolescents with mental retardation was characterized by action in a difficult

situation according to the pattern using from one to three coping strategies, while adolescents with normative development have a wide range of behavioral strategies. The primitive strategies of coping behavior of adolescents with mental retardation are partly due to the lack of flexibility of their thinking, reduced ability to learn, delayed accumulation of life experience.

Conclusions:

Thus, the accentuation of character, lack of intelligence, lack of family education of mentally retarded adolescents often cause violations of their social adaptation in the environment. Among the various character accentuations in adolescents with mental retardation, epileptoid type of character accentuation is statistically more common. Different types of character accentuations in adolescents with mental retardation significantly affect the structure of psychological protection.

The greatest manifestation of the protection mechanisms identified in adolescents with mental retardation with the sensitive-schizoid, sensitive, hyperthymic, asthenic-neurotic character accentuation, and coping strategies - labile, sensitive-schizoid, schizoid-epileptic of character accentuations.

For accentuated adolescents with mental retardation, the most effective coping strategies are “entertainment and physical relaxation” and “search for social support”. The interrelationships of psychological protection mechanisms, conscious coping strategies and behavioural characteristics of adolescents with mental retardation indicate the complex impact of psychological protection on the socio-psychological adaptation of these adolescents.

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SECTION 20. Medicine.

CLINICAL AND PSYCHOLOGICAL FEATURES OF PRE-SUICIDAL PERIOD OF SUICIDES

Abstract: *To study the peculiarities of the presuicidal period and the personal characteristics of suicides, 36 patients admitted to the city clinical psychiatric hospital in Tashkent in connection with the suicide attempt were examined by clinical psychopathological method. The revealed personal characteristics of suicides determine a high probability of occurrence of disadaptation disorders, which are the source of suicidal behavior.*

Key words: *suicide, suicidal behavior, personality features*

Language: *English*

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Introduction

Suicidal behavior, due to the severity of medical, socio-psychological and economic consequences are classified as not only general medical, but also global problems of humanity. Suicidal behavior is a manifestation of suicidal activity. It includes suicidal thoughts, intentions, statements, threats, suicidal attempts and attempts.

According to WHO, the suicide rate in the world has increased by 60% over the past 45 years. The highest suicide risk is in Eastern Europe, where the suicide rate varies from 3.8 to 40 per 100,000 population [1, p. 34].

According to numerous sample studies, the number of male suicides per female suicide varies from 3 to 8 [2, p. 59]. In patients of general practice, the frequency of suicidal thoughts is 1 (for the last week) – 10%, but more often in mentally (depressive) and somatically (heart disease, gastric ulcer) patients suffering from physical diseases [5, p. 46]. Suicidal thoughts are connected with the deterioration of the medical prognosis: with an increase of 23% in the risk of non – suicidal mortality, mainly due to cardiovascular diseases, over the next 17 years after the control of demographic variables, bodily health, symptoms of depression and anxiety, possible dementia [11, p. 22].

Taking into account the number of failed suicides, which occur 20 times more often, the scale of the problem increases even more [3, p. 437; 10, p. 63]. The level of suicide among persons with serious mental illness, higher than the suicide rate in the General population is 2.5 to 5 times [4, p. 35; 7, p. 22]. The percentage of detected affective disorders among suicides ranges from 70 to 80% [9, p. 30]. Features of the mental state of persons who have made suicidal attempts are the subject of research of scientists, practitioners, sociologists, psychologists, psychiatrists.

Suicidal acts are usually planned and carried out alone. The reaction of this type is characteristic of mature persons over 40 years of age, in which suicide is usually committed expressed depression. It should be noted that the majority of suicides in the early stages of suicidal behavior there is a state of fighting motives: on the one hand, there are suicidal motives, on the other — there are thoughts about the obligations to children, unwillingness to bring grief to relatives, fear of death and other holding a person from committing a suicide act motives. In other words, suicides are struggling with suicidal and anti-suicidal motives, and the more pronounced the latter, the less likely it is to be suicidal.

Stressful life events at a critical moment of development reveal a predisposition to suicidal behavior. Interpersonal (family) disorder, money and production problems, violations of the law are common for young suicides, but chronic painful disabling bodily ailments, serious losses (life partner, particularly sudden) – typical distresses a week-months before suicidal behavior of elderly [6, p.

401]. Often the problems are chronic, cumulated, men are more vulnerable [8, p. 310].

The aim of the study was to study the features of the presuicidal period and the personality characteristics of suicides.

Material and methods:

Clinical and psychopathological method examined 36 patients admitted to the city clinical psychiatric hospital in Tashkent in connection with the suicide attempt. The mean age of the examined patients was 34.4 ± 2.3 years. Assessment of mental status was carried out in the post-suicidal period and the reconstruction of the pre-suicidal period. Holms and RAE methods were used to determine stress resistance and social adaptation of suicides.

Depressive disorders are differentiated according to the type of a host affect. The survey results were supplemented by an analysis of standardized psychometric scales – scale Montgomery-Asberg (MADRS) to assess the level of depression, scales of self-esteem level of situational and personality anxiety Spielberger Ch.D. - Hanin Yu.L., questionnaire Smisek-Leongard, methods for determining the level of subjective control (UIC). The peculiarities of psychological protection mechanisms were studied using the Plutchik-Kellerman-Konte method.

Results and discussion:

The analysis of background factors preceding the development of depression revealed psychopathologically burdened inheritance in 28 % of patients, with the most frequent diseases of close relatives were affective disorders of various genesis and alcoholism. Premorbid personal characteristics of patients with depressive disorders were sufficiently pronounced, which allowed them to be attributed to explicit character accentuations with a predominance of inhibitable (27.2 %) and cycloidal traits (15.8 %).

Eating disorders were observed in 57.9 % of patients. Appetite reduction was often combined with some gastrointestinal disorders: heartburn, flatulence, constipation, diarrhea. In some cases, a clear reduction in appetite was not enough, but patients talked about the lack of pleasure from eating. Sleep disorders in patients were observed in 71 % of cases. The most frequent difficulty falling asleep since seizing representations or exhausting inner dialogue, night and early awakening, shallow sleep with anxious dreams. There was also a dream with a sense of continuous thought work as well as a feeling of complete lack of sleep - a kind of phenomenon, which we have identified as “agnosia” sleep. Lack of energy or fatigue ranked second after depressed mood (79.4 %). Patients usually complain of fatigue, weakness, fragility, unwillingness to do anything, reduced performance. The sense of weakness that is perceived by patients as a fairly severe violation of the usual sensations of your body begin to occur hypochondriac fears, phobic reaction, obsessive doubts. Low self-esteem were found in 62.5 % of cases and most often concerned cognitive capabilities, ability to work, physical strength and energy. Was noted secondary to the idea of guilt that arise transiently in connection with the jet experiencing life circumstances. Disturbance of concentration or difficulty in decision-making was observed in 50.5 % of patients. Complaints were the lack or loss of memory, difficulty in focusing, lack of volitional activity.

When determining stress resistance and social adaptation with the help of Holmes-RAE method, the sum of the points of vital events experienced by suicides was calculated. The majority of suicides (by 78.2%) resistance to stress was to the threshold or lower. The number of points in women and men did not differ significantly. This confirms the subjective perception of stressful events and maladjustment relative to each suicide.

Affective-tensioned type presuicidal defined in 90.2% of cases (mostly patients with neurotic and personality disorders, organic brain damage). Affective-reduced version of presuicidal met in 9.8% of patients, mainly with endogenous mental disorders.

The duration of pre-suicidal period was uneven: chronic pressuized is 58.4%, acute pressuized of 38.5%, subacute pressuized is 3.1%.

Almost all patients who made suicidal attempts, testified to the inability to manage their desires. Precisely the absence of control over suicidal thoughts remains ready has led to transition from domestic forms of suicidal to targeted action.

The study was studied the personal characteristics of suicides. With the help of questionnaire Smisek-Leongard of suicides revealed the predominance of such traits as emotively (18.3%), cyclothymia (15.9%), anxiety (15.1 per cent). For men was typical of cyclothymia (30.2%) and anxiety (25.4%), and for women – emotively (42.9%), anxiety (31.7%), cyclothymia (27.8%) and exaltation (23.0%).

A method for determining the level of subjective control has allowed to reveal significant predominance of the externality factor in all spheres of activities of subjects that speaks about loss by the person of control over their actions. Among the types of psychological protection by the method of Plutchik-Kellerman-Konte prevailed: projection (61,1%), reactive formations (60,3%) and rationalization (57,3%). Regression (34.3%) and substitution (26.7%) were less common. The revealed distribution of types of psychological protection explains the direction of aggressive trends in suicidal behavior on their own personality.

The use of the scale Spilberger Ch.D. - Hanina Yu.L. showed that among men more often there was moderate, and in women – a high level of personal anxiety in the prevalence of high rates of situational anxiety in both sexes. With mild and moderate depression, predominantly moderate personal anxiety was recorded. Severe depression was represented by high and moderate levels. Consequently, the increase in the severity of depressive disorder leads to an increase in the level of personal anxiety and increases the risk of suicide.

Indicators of the level of situational anxiety were equally represented by a high and moderate degree, regardless of the severity of depressive symptoms. The high level of situational anxiety prevented the severity of suicidal act, increased suicidal activity in general, that is, responsible for the speed of autoagressive response to the situation, regardless of the severity of depressive disorder.

Thus, situational anxiety, in contrast to trait anxiety, reduces the severity of suicidal intent, but increases the likelihood of self-injurious, including demonstration activities. It should be noted that the most often high rates of personal and situational anxiety were found in patients with schizophrenia.

Conclusions:

Thus, the personal characteristics of suicides were characterized by violation of communication abilities, inadequate self-regulation, high degree of personal and situational anxiety, prevalence of unproductive methods of psychological protection and structure of agressiveness, low or threshold resistance to stress (78.2% of suicides), which determines the high probability of disadaptation disorders, which are the source of suicidal behavior.

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SECTION 20. Medicine.

PSYCHOLOGICAL FEATURES OF THE PERSONALITY OF PATIENTS WITH ALCOHOL ADDICTION

Abstract: *On the basis of the complex analysis of personality peculiarities of patients with alcohol addiction significant diagnostic psychological markers are determined, which allow predicting the duration of therapeutic remission and the degree of rehabilitation resource. A certain set of motivational, characterological and individual-typological features of the personality of patients with alcohol addiction affect the effectiveness of therapeutic remission.*

Key words: *alcohol addiction, psychological features, personality*

Language: *English*

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Introduction

The medico-social significance of the problem is determined, first of all, by the high prevalence of alcohol consumption and its harmful effects on the health of the population. The structure of addiction is still dominated by alcohol disorders [1, p. 90]. Most modern researchers of alcohol addiction believe that the main role in the development of chronic alcoholism belongs to microsocial factors, but the effect of which is mediated by the personality of the patient, his reactions to favorable and negative social impacts [2, p. 74].

In this regard, the analysis of the dependence of the effectiveness of the treatment of chronic alcoholism on the peculiarities of the personal sphere of patients is important not only for the study of the clinic and the pathogenesis of the disease [3, p. 308], but also is of independent interest for the theoretical development of personality psychology [4, p. 182]. It should be noted that the ideas about the structure of personal changes in patients with chronic alcoholism are not holistic, unambiguous, systematized and, accordingly, need further study [5, p. 90].

First of all, we are talking about the study of the role of motivational entities in the formation and course of the disease [6, p. 10], which is important for understanding its clinic and pathogenesis and opens up new opportunities for improving the system of treatment and rehabilitation of patients with chronic alcoholism [7, p. 606]. Many biological, psychological and social factors play a role in the emergence and development of chronic alcoholism [8, p. 62]. In this case, the personal characteristics of patients remain significant at any stage of the course of the disease: in the initial period, the developed stage or in the period of relative well-being and arise as a result of treatment or for any other reason [9, p. 118].

At the same time, psychological factors closely related to the personal characteristics of the individual can contribute to favorable results of treatment, a relatively benign course of the disease and prevent the desired results of therapy, reducing its effectiveness, contribute to the weighting of the painful process [10, p. 356]. This necessitates a careful study of the individual characteristics of each patient and determine their role during the disease in order to in one case use them as a tool in the rehabilitation process, and in the other to carry out their appropriate correction to avoid failure in treatment and recovery activities [11, p. 120].

The aim of the study was to study the motivational, individual-typological and characterological characteristics of the personality of patients with alcohol addiction and their relationship with the duration of therapeutic remission.

Material and methods:

The psychological examination of 57 patients with alcohol addiction who underwent inpatient

treatment in the Republican Narcology Center of Uzbekistan was conducted in the course of the study. Methods of clinical diagnosis (observation, conversation, analysis of life history and disease), which contributed to the establishment of contact and collection of history, became research methods. Of psychometric techniques were used: a questionnaire of motives of alcohol consumption and abstinence from alcohol consumption is to identify the dominant motives of consumption and abstinence from alcohol consumption, test to evaluate therapeutic units to diagnose the severity of installations for the treatment, sobriety and life goals, the questionnaire Smisek-Leonhard, a standardized multi-factor method of personality research is to identify individual-typological peculiarities of the personality of patients with chronic alcoholism, the test Rokich - to identify the main life goals and means of achieving these goals.

Results and discussion:

We have undertaken research of personal features of patients with chronic alcoholism and their interrelation with duration of therapeutic remission. We proceeded from the fact that the analysis of the identity of the personal characteristics of patients with chronic alcoholism will lead to a more adequate understanding of the psychological mechanisms of personality functioning in this population of patients that will later serve as a justification for a differential approach to psychotherapy with these patients. During the study, we found that many patients are psychologically not ready for treatment, i.e. to the process of changing their behavior - the transition from alcohol intake to cessation. Therefore, before the use of special treatments, it is necessary to prepare the patient for the process of changing their own lifestyle. Our study showed that persons with prior consultation in the form of psychological research and motivational interviewing, addiction treatment is much more successful than those who once were included in the treatment program. The results of the study significantly expand the existing traditional ideas about the personal characteristics of patients with chronic alcoholism and indications for short-term methods of psychotherapy.

In the structure of motivation of alcohol consumption in patients who fail to comply with the regime of sobriety, dominated by socio-traditional and hedonic motives. The motives of the pathological group (hangover and additive) and ataractic motives are presented slightly. In patients with chronic alcoholism, admitting "setbacks" in the first year of remission, it was observed the dominance of ergopathic, sensitive and harmonious types of attitude to disease. In patients with the leading disturbing type of the relation to alcoholism and type of reaction with an intrapsychic orientation of violations of the mode of sobriety it wasn't noted.

The greatest number of remission disorders was revealed in patients with chronic alcoholism with pronounced emotional lability, prone to neurotic protective reactions of conversion type and rigidity, manifested by a subjective logical scheme, often unsuitable for external correction. Insufficient duration of therapeutic remission is observed in patients with chronic alcoholism with an external variant of the total therapeutic settings manifested in cognitive, affective and behavioral spheres.

The main individual-typological and characterological features of the personality, increasing the duration of therapeutic remission are: age-31-40 years; the presence of 1-2 or 2 stages of chronic alcoholism; in the structure of the motivation of alcohol consumption predominate ataractic and actually pathological motives; the prevailing tone of the sympathetic nervous system; dominated by an alarming type of attitude to the disease; expressed internal and intermediate settings for treatment, sobriety and target settings; balance of personal qualities; the presence of a stress component during the examination; the presence of signs of asthenization; sufficient reliability of the examination; changes in physiological parameters during the psychological examination.

Quantitative analysis of the questionnaires for the study of the personal characteristics consisted in counting the points for each test, determining the percentage of subjects with accentuation in the group of subjects with alcohol addiction. We have identified that for individuals suffering from alcohol dependence, is characterized by such accentuation, as turned, anxiety and cyclothyme. Thus, it can be said that alcoholism, on the one hand, contributes to the sharpening of such traits that form the basis of these accents, and, on the other hand, for people prone to alcohol dependence, characterized by such traits as lack of discipline, striving for leadership and domination by any means; increased anxiety, low self-esteem, the desire to avoid responsibility, a high motive for avoiding failure, the dominance of psychological protection mechanisms by the type of avoidance; sharp mood swings, a tendency to autoagression.

It should be noted that among persons suffering from alcohol addiction, there are people with other accentuations of character: exaltation, disciminate, ostentation, pedantry, emotively, jam.

The main individual and psychological parameters of the personality of patients with chronic alcoholism, having a stable remission for more than three years are: the presence of a strong sober attitude and position, acquired the skills of a healthy lifestyle, formed a sober outlook. The main motive of the activity-maintaining the position and achieving success; social readaptation (preservation of family relations, employment). The following prevails: the leading emotion stability, and position in life -

mature, courageous, the basic type of response - a strong, characteristic resistance, persistence, leadership, desire for self-assertion, stability, emotional state, the absence of severe anxiety; signs of psychological addiction to alcohol desactualized; in the structure of motivation for abstinence of alcohol consumption is dominated by motives associated with health and lack of psychological addiction to alcohol.

Conclusions:

Thus, on the basis of a comprehensive analysis of the personality characteristics of patients with alcohol addiction, significant diagnostic psychological markers are determined that allow predicting the duration of therapeutic remission and the degree of rehabilitation resource. A certain set of motivational, characterological and individual-typological features of the personality of patients with alcohol addiction affect the effectiveness of therapeutic remission.

Psychological features of the personality of patients with alcohol dependence characterize the level of readaptation, which is a criterion for the effectiveness of psychotherapeutic treatment. An intensive psychological correction, built taking into account personal characteristics of patients and clinical disease, is essential to achieve a positive therapeutic dynamics.

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SECTION 4. Computer science, computer engineering and automation.

ENSEMBLE LEARNING METHOD DEVELOPMENT FOR SOLVING THE PREDICTION PROBLEM ON THE EXAMPLE OF ORACLE DATA MINING TECHNOLOGY

Abstract: *The article reviews the existing machine learning methods, which solve the prediction problem, and related issues. The modification of the bagging method, which aggregates two fundamentally different basic machine learning algorithms, is proposed and justified. The research of the method, based on the examples of risk estimation of the cardiovascular disease and forecasting the dynamics of General Electronic company stock, confirms the effectiveness of the method.*

Key words: *prediction problem, classification, regression, bagging, data mining, machine learning, Oracle Data Mining*

Language: *Russian*

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РАЗРАБОТКА МЕТОДА КОМПОЗИЦИИ АЛГОРИТМОВ МАШИННОГО ОБУЧЕНИЯ ДЛЯ РЕШЕНИЯ ЗАДАЧИ ПРОГНОЗИРОВАНИЯ НА ПРИМЕРЕ ТЕХНОЛОГИИ ORACLE DATA MINING

Аннотация: *В статье рассмотрены существующие методы машинного обучения, решающие задачу прогнозирования, и обозначены их недостатки. Предложен и обоснован метод, решающий задачу прогнозирования посредством агрегирования результатов двух базовых алгоритмов машинного обучения, противоположных по природе. Проведено исследование метода на примере оценки рисков кардиологических заболеваний и прогнозирования динамики роста акций компании General Electronic, подтвердившее эффективность разработанного подхода.*

Ключевые слова: *машинное обучение, задача прогнозирования, классификация, регрессия, интеллектуальный анализ данных*

Введение

На сегодняшний день компьютерные технологии заняли одно из главных мест, как в повседневной жизни человека, так и в бизнесе. Благодаря быстрому развитию и совершенствованию аппаратной части и программного обеспечения цифровых устройств за пару десятков лет заметно снизилась стоимость вычислительных ресурсов, в том числе и параллельных, оперативной и постоянной памяти. Все это привело к накоплению больших объемов разнородных данных, исчисляющихся терабайтами, которые обозначаются термином большие данные. Такое количество информации человек не способен обработать вручную, кроме того, и традиционные программы, имеющие конечное число решений и состояний, также плохо справляются с задачами анализа и обработки больших данных. В связи с этим появилось новое направление в науке и технологиях - машинное обучение.

Так как анализ больших данных изначально является не искусственной задачей, а необходимостью современной жизни человека, существует множество различных алгоритмов машинного обучения, среди которых выделяются несколько главных групп по свойствам решаемых ими задач. При применении алгоритма

машинного обучения для решения конкретной задачи в большинстве случаев требуются дополнительные эвристики, эксперименты и различные модели для компенсации зависимостей и закономерностей, свойственных выбранному подмножеству данных и предположений.

Таким образом, с помощью алгоритмов и методов машинного обучения можно решать большое число практических задач в разнообразных сферах человеческой деятельности. Одной из таких задач является задача прогнозирования, которая заключается в предсказании значений некоторых параметров или свойств системы в будущем на основе зависимостей, которые могут быть найдены с помощью известных параметров и поведении системы в прошлом и настоящем. Например, в медицине можно предсказывать риски заболеваний по анализам пациента, в экономике – поведение рынка как ценных бумаг, так и потребительского, кроме того появляется возможность оценить потребительскую корзину и создать персонализированную рекламу. В банковской сфере – оценивать кредитные риски, в сфере безопасности – выявлять мошенников и преступников, в повседневной жизни – экономить время и беречь здоровье за счет предсказания времени прибытия общественного транспорта.

Цель работы

Для прогнозирования каких-либо значений, будь то курс криптовалюты в следующем месяце, вероятность развития сердечного заболевания через несколько лет или же состав потребительской корзины, требуется выявить закономерность по существующим данным, которые были собраны в прошлом и настоящем.

На сегодняшний день существует несколько алгоритмов машинного обучения, решающих данную задачу, каждый из которых ищет закономерность, основываясь на теоремах математической статистики, теории вероятности, дискретной математики или теории графов. Кроме того, базовые алгоритмы объединяют в композиции для получения более точной модели.

Но все же остается вопрос, какой алгоритм выбрать для решения задачи прогнозирования.

Целью данной работы является разработка универсального метода композиции алгоритмов машинного обучения для решения задачи прогнозирования на примере технологии Oracle Data Mining.

Алгоритмы машинного обучения, решающие задачу прогнозирования

Для начала рассмотрим подходы и методы решения задачи прогнозирования, существующие на сегодняшний день.

Данная задача является обобщением двух классических задач интеллектуального анализа данных: классификации и регрессии. Они относятся к прогностическому обучению, которое также называют обучением с учителем [1, с.2]. Его суть заключается в том, чтобы научиться связывать входные и выходные значения. При обучении прогнозирующей модели на вход подается тренировочный набор данных, на основе которого выводятся взаимосвязи или функции зависимостей, с помощью которых уже на реальных данных получают требуемые значения. Сам тренировочный набор данных представляет из себя множество экземпляров, каждый из которых описан значениями атрибутов или свойств.

Суть классификации состоит в определении зависимости принадлежности элемента к классу на основе его свойств по средству сопоставления входных и выходных данных [2, с.5]. Регрессия одновременно очень схожа и отличается от классификации. Главное отличие регрессии в том, что она позволяет обрабатывать как дискретные, так и непрерывные величины, что является значительным достоинством, поскольку большая часть измерений в реальном мире описываются законами или функциями [3]. Второе принципиальное отличие регрессии от классификации состоит в том, что результатом классификации является вероятность принадлежности элемента к некоторому классу, а регрессии – определенное значение, выбранного для прогнозирования параметра.

Задачу классификации решает большой круг алгоритмов машинного обучения. К нему относят байесовский классификатор, линейный классификатор, решающие деревья, решающие списки, логистическую регрессию, машину опорных векторов и их модификации [1, 4].

Кроме того, существует несколько разных подходов к составлению из данных алгоритмов композиции.

Первый подход заключается в обучении каждого алгоритма на случайном подмножестве тренировочного набора данных, причем каждый алгоритм получает свое подмножество на вход и данные подмножества могут пересекаться, и агрегации результатов данных алгоритмов путем простого или взвешенного голосования [5, с.587].

Второй подход заключается в последовательном обучении каждого алгоритма на той подвыборке тренировочного набора данных, на котором предыдущие алгоритмы показали недостаточно точный прогноз [1, с.556].

Поскольку задача регрессии очень схожа с задачей классификации, алгоритмы, решающие

эти две задачи, также схожи. Задачу регрессии решают алгоритм линейной регрессии, алгоритм нелинейной регрессии и метод опорных векторов [2].

Стоит отметить, что обобщенная линейная модель объединяет в себе как линейный классификатор, так и алгоритм линейной регрессии.

Таким образом, с помощью решения задачи классификации мы сможем спрогнозировать динамику некоторого параметра, например, динамику роста или спада спроса на кукурузу, или оценить риск появления урагана через месяц, а с помощью решения задачи регрессии предсказать значение параметра, например, цену на кукурузу или день появления урагана.

Проблемы существующих методов

Выбор алгоритма машинного обучения зависит от требований и условий поставленной задачи. Кроме того, точность решения задачи классификации и регрессии очень чувствительна к данным. Таким образом, при сильно зашумленных данных, или при малой и однотипной обучающей выборке, которая содержит дополнительные свойства, не распространяющиеся на все множество, для которого производится прогноз, невозможно получить качественный результат [6]. Кроме того, принципы, на которых построены алгоритмы машинного обучения, различаются, что позволяет им находить зависимости абсолютно разной природы: от линейных зависимостей до зависимостей очень сложной и причудливой формы.

Существует также проблема эффекта переобучения, который заключается в том, что на тренировочном наборе данных получается модель высокой точности, а на реальных данных параметры модели не удовлетворяют поставленной задаче [1, с.22]. В связи с этим требуется очень тщательно подбирать данные для обучения и тестирования, чтобы экземпляры тренировочного набора как можно шире были распределены в множестве всех возможных значений, а не представляли собой подмножество, имеющее особый признак относительно всего множества экземпляров.

Поскольку не всегда есть возможность проводить трудоемкий анализ данных для выявления свойств зависимостей, например, из-за недостатка квалификации сотрудников, требуется универсальный метод выбора алгоритма машинного обучения, который будет рассматривать данные с помощью разных подходов.

Универсальный метод композиции алгоритмов машинного обучения

Поскольку, как было сказано выше, задачи классификации и регрессии во многом схожи, предположим, что существует универсальный метод для их решения. В таком случае возьмем несколько алгоритмов, которые решают обе задачи, имеют различную природу и построим над ними композицию с помощью агрегирования результатов нескольких базовых алгоритмов, построенных на основе различных подмножеств элементов тренировочной выборки. Заметим, что, чем меньше алгоритмов участвуют в композиции, тем меньше используется вычислительных ресурсов и памяти.

Метод агрегирования результатов нескольких алгоритмов композиции рекомендуется использовать с нечетным количеством базовых алгоритмов, что связано с проблемой состояния неопределенности, в случае, когда результаты базовых алгоритмов различаются в равной степени. Однако, если произвести некоторую модификацию правила выбора результирующего значения, то можно построить композицию над двумя алгоритмами. Модификация заключается в использовании вероятности отнесения данного объекта к выбранному классу. То есть результирующим является тот ответ, у которого вероятность больше. В случае, если вероятности равны, выберем результат первой базовой модели. Из-за того, что, значения вероятностей принадлежат бесконечному множеству действительных чисел в интервале от 0 до 1, в отличие от конечного множества результатов классификации, то вероятность получения ситуации неопределенности стремится к 0. При решении задачи регрессии будем выбирать среднее арифметическое значение из двух результатов.

Базовые алгоритмы композиции

Как уже было сказано, для универсальности метода требуется выбрать алгоритмы разной природы. Такими алгоритмами являются линейный классификатор и машина опорных векторов с нелинейным гауссовским ядром [2, с.54, 4, с.247]. Данные алгоритмы решают обе задачи и строят разделяющую поверхность классов разными методами: классическими градиентными методами, минимизируя ошибку, и средствами квадратичного программирования, максимизируя зазор между классами, соответственно. Таким образом, алгоритмы способны компенсировать друг друга. Кроме того, компенсация будет производиться за счет построения индивидуальной обучающей выборки для каждого базового алгоритма путем случайного выбора элементов из тренировочного набора.

Следует отметить также, что к достоинствам линейной регрессии можно отнести быстроту и

простоту создания модели, результат для которой может быть получен аналитически. Также данная модель позволяет сделать дополнительные выводы о характере зависимости предикторов и отклика по коэффициентам регрессии. К тому же, данный алгоритм хорошо изучен: известны его проблемы и методы их решения.

Главным преимуществом метода опорных векторов является сведение обучения машины опорных векторов к задаче квадратического программирования, которая имеет единственное решение и эффективное вычисление, в том числе в случаях больших объемов данных обучающей выборки. Кроме того, оптимальное положение разделяющей гиперплоскости зависит только от опорных векторов, которые составляют малую долю всех объектов выборки.

Таким образом, в результате составления композиции на основе данных алгоритмов получим метод, который позволит прогнозировать любые показатели на основе любых данных, не требуя предварительного аналитического и статистического анализа.

Реализация

Постановка задачи прогнозирования для реализации

Для реализации, описанного ранее универсального метода выбора алгоритма машинного обучения для решения задачи прогнозирования, были сформулированы следующее задания:

- оценка рисков кардиологических заболеваний;
- прогнозирование динамики фондового рынка.

Оценка рисков кардиологических заболеваний на основе анализов пациента является одной из задач медицины, которая хорошо поддается математическому и интеллектуальному анализу [7]. Кроме того, существует аналог ее решения, который называется формулой Фременгхэма [8]. Данная формула используется на практике врачами и основана на подсчете суммы баллов, которые присваиваются или изымаются в зависимости от показаний пациента. Стоит отметить, что данная формула гарантирует свой результат лишь на 30%.

Прогнозирование динамики курса акций является актуальной задачей в сфере экономики и финансов как со стороны участника торгов, который должен принять решение о приобретении или продаже акций, так и со стороны организаторов фондового рынка для управления над ним. Несколько лет назад данное прогнозирование производилось с помощью технического анализа, но он не охватывает всех параметров и объектов, влияющих на цены акций [9]. Именно поэтому, с популяризацией и массовым внедрением программных средств, использующих алгоритмы машинного обучения, прогнозирование динамики фондового рынка выходит на новый уровень, качественно превосходящий технический анализ.

В ходе данной работы были построены следующие 4 модели, использующие предложенный метод композиции алгоритмов машинного обучения, на примере технологии Oracle Data Mining:

- модель, прогнозирующая присутствие или отсутствие кардиологического заболевания пациента;
- модель, прогнозирующая время, через которое у пациента появится кардиологическое заболевание;
- модель, прогнозирующая рост или спад цен акций компании General Electronic;
- модель, прогнозирующая цены закрытия акций компании General Electronic.

Таким образом, модели, построенные с помощью одного метода, решают, как задачи классификации, так и задачи регрессии на двух различных наборах данных из разных областей человеческой деятельности.

Технология для реализации

В наши дни как уже было сказано ранее накоплены экзабайты данных ретроспективного характера. Только половина этих данных структурирована и может быть подвержена интеллектуальному анализу. Самый распространенный способ структуризации и хранения данных, это организация баз данных. Именно в них находиться большая часть структурированных данных. В связи с этим, для обеспечения большей производительности и защиты, а также снижению накладных расходов на передачу данных, проведение интеллектуального анализа средствами базы данных является более предпочтительным. В данной работе используется технология системы управления реляционными базами данных Oracle Enterprise Edition версии 12c Oracle Data Mining.

В ходе данной работы при построении моделей был использован PL/SQL API, который реализован пакетом DBMS_DATA_MINING [10].

Исходные данные

В качестве исходных данных для моделей, оценивающих риски кардиологических заболеваний, в данной работе был использован набор «Framingham Heart Study», который был запрошен в Национальном Университете Сердца, Легких и Крови. Этот набор представляет собой данные о пациенте, такие как возраст, пол,

индекс массы тела, показатели давления, наличие или отсутствие диабета и так далее [11]. Показатели для каждого пациента представлены 3 записями, поскольку были сняты 3 раза на протяжении 12 лет через равные промежутки времени. Из данного набора было выбрано случайным образом 10000 строк, которые позднее были разбиты на две части: обучающую и тестовую, которые составляют 7000 и 3000 записей соответственно.

В качестве входных данных для моделей, прогнозирующих динамику курса акций, было выбрано подмножество данных «Huge Stock Market Dataset», содержащее информацию о акциях компании General Electronic. Данный набор находится в открытом доступе на платформе для соревнований в области науки о данных Kaggle [12]. Он представляет 10000 записей, содержащих дату, цены начала и окончания торгов, максимальную и минимальную цены акции и волатильность. Данный набор также был разделен на 2 части: обучающую и тестовую, которые составят 7000 и 3000 записей соответственно.

Далее в соответствии с рекомендациями Oracle были преобразованы типы данных в обоих наборах данных следующим образом:

- категориальные переменные, например, идентификатор пациента, преобразовываются к строковому типу данных;
- даты преобразовываются к численному типу данных посредством вычитания из сегодняшней даты – даты, указанной в наборе.

Причем за один объект набора «Framingham Heart Study» был взят пациент в определенный период сдачи анализов и показаний, для этого переменные идентификатора пациента и периода были объединены в одну с помощью операции конкатенации. Все остальные переменные, которые должны быть предсказанными, были удалены, так как в случае реальных данных их значения не определены, то есть они присутствуют только в обучающем и тестовом наборах. Таким образом, остается только информация о заболеваниях инфаркта миокарда и коронарной болезни сердца, которые представлены одной переменной. Также показания о холестерине были отброшены, поскольку неопределенных значений в 5 раз больше определенных. Это связано с тем, что этот показатель измерялся только в последнем периоде из трех.

Таким образом, были сформированы обучающие и тестовые выборки, в той форме, в которой модель способна правильно их трактовать.

Построение моделей

Для реализации метода композиции базовых алгоритмов машинного обучения потребовалось написать на языке PL/SQL код-надстройку для вызова процедуры создания модели пакета DBMS_DATA_MINING. Это связно с тем, что помимо непосредственного вызова процедуры создания модели требуется подготовка индивидуальных, для каждого базового алгоритма композиции, выборок и получение прогнозируемого значения на основе результатов базовых алгоритмов.

Создание индивидуальной выборки

Поскольку метод основывается на композиции, агрегирующей результаты нескольких базовых алгоритмов, построенных на основе различных подмножеств элементов обучающей выборки, первым этапом построения модели является создание этих выборок. В нашем случае их две, поскольку по описанным ранее причинам в методе используется два базовых алгоритма. Отметим, что каждая такая выборка должна содержать подмножество элементов обучающей выборки, которые могут повторяться. В следствии чего, строки тренировочного набора были пронумерованы, каждый раз генерировалось псевдослучайное число и в текущую подвыборку была добавлена та строка из обучающей выборки, номер которой совпадал с полученным числом. Данная операция была повторена столько раз, сколько строк требовалось в подвыборке. В данной работе такое число 5000, поскольку оно должно быть меньше, чем количество строк исходной выборки, но все же строк должно быть достаточно для устойчивости к переобучению. Опытным путем было выяснено, что среди 4000, 5000 и 6000 записей в индивидуальной выборке, 5000 показывают наилучший результат работы метода.

Для повышения производительности было принято решение каждый раз добавлять не по одной строке, а по 1000. Для этого сначала было сгенерировано 1000 псевдослучайных чисел, а затем в таблицу каждой индивидуальной выборки были добавлены те строки из обучающей выборки, номера которых совпадали с полученными числами. Поскольку псевдослучайные числа повторялись, то каждый раз в выборку добавлялось меньше 1000 строк. Данное свойство было учтено, вследствие чего алгоритм генерации псевдослучайных чисел и их добавления в подвыборку был запущен на 1 раз больше. Таким образом, для получения 5000 строк потребовалось 6 запусков алгоритма, при этом полученная выборка содержала около 5500 строк.

Выбор параметров модели

Далее потребовалась настройка каждой модели. Идентификатор задачи, которую решает модель, было решено передавать в процедуру, реализующую метод композиции базовых алгоритмов, в качестве параметра. Для него осуществлена проверка на соответствие одному из двух допустимых значений. Этот параметр также передается обоим базовым алгоритмам на вход. Далее для каждой из моделей был включен параметр ADR, который позволяет автоматически производить нормировку входных данных при построении модели базовым алгоритмом.

В соответствии с реализуемым методом первая базовая модель была основана на обобщенном линейном алгоритме. Такая модель способна выявлять линейные зависимости и закономерности. Второй базовой модели соответствовала машина опорных векторов с гауссовским ядром, а также было разрешено применение активного обучения, что позволяет сократить использование ресурсов памяти.

Остальные параметры принимали значения по умолчанию. Также стоит отметить, что большая часть параметров принимают значения автоматически, основываясь на входных данных [10].

Таким образом, была получена таблица настроек для каждой из двух моделей, которые могут быть поданы на вход процедуре построения модели CREATE_MODEL пакета DBMS_DATA_MINING.

Описание процедуры, реализующей метод композиции базовых алгоритмов машинного обучения

Как уже было сказано ранее, реализация предложенного в данной работе метода требует надстройки над PL/SQL API, который поставляется технологией Oracle Data Mining. Для этого была создана хранимая PL/SQL процедура, принимающая на вход название модели, имя таблицы с обучающей выборкой, идентификатор решающейся задачи, имя ключевого атрибута и имя атрибута, который требуется спрогнозировать.

Кроме того, данная процедура принимает на вход флаг, который отвечает за создание индивидуальных выборок для каждого базового алгоритма. В таком случае модель можно пересоздать, например, если требуется спрогнозировать другой атрибут или проанализировать работу метода при разных параметрах, не пересоздавая и не меняя при этом сами данные. Создание индивидуальной выборки в данной работе реализовано отдельной хранимой процедурой PL/SQL, которая принимает на вход название таблицы с обучающей выборкой, количество выборок, которое должно получиться на выходе, и количество тысяч строк, которое должно быть в каждой из выходных выборок.

В зависимости от значения флага в процедуре, реализующей универсальный метод, вызывается или не вызывается процедура создания двух подвыборок на 5000 записей. Далее вызывается процедура создания базовой модели на основе обобщенного линейного алгоритма для первой индивидуальной выборки, а затем на основе машины опорных векторов для второй.

Затем создается представление, которое содержит два столбца: идентификатор объекта и спрогнозированное значение. При решении задач классификации выбирается то значение из двух, у которого вероятность больше. В случае решения задачи регрессии спрогнозированным значением становится среднее арифметическое результатов работы двух базовых моделей.

Анализ полученных результатов

После построения моделей, прогнозирующих риски кардиологических заболеваний и динамику роста или спада цен акций компании General Electronic, были оценены ошибки этих моделей на основе тестовых выборок.

Для моделей, решающих задачу классификации, была посчитана доля неправильных ответов по формуле (1):

$$Q(a, X) = \frac{1}{m}\sum_{i=1}^{m}[a(x_i) \neq y_i], \qquad (1)$$

где x_i – i-ый объект тестовой выборки, y_i – исходный идентификатор класса объекта x_i, a – спрогнозированный идентификатор класса объекта x_i моделью, m – количество объектов тестовой выборки X. Для моделей, решающих задачу регрессии была посчитана среднеквадратичная и абсолютная средняя ошибки по формулам (2) и (3) соответственно:

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}, \qquad (2)$$

$$MAE = \frac{1}{n}\sum_{i=1}^{n}|y_i - \hat{y}_i|, \qquad (3)$$

где y_i – исходный идентификатор класса объекта, $\hat{y}_i$ – спрогнозированный идентификатор класса объекта, n – количество объектов тестовой выборки.

Оценки ошибок для универсального метода, представлены в строке с названием алгоритма «Универсальный метод» в таблице 1. Для проведения сравнительного анализа в ходе данной работы были также построены модели на основе тех же обучающих выборок, что и

предложенный метод, с помощью реализованных алгоритмов машинного обучения в технологии Oracle Data Mining, решающих задачи классификации и регрессии. Кроме того, был построен прогноз с помощью встроенной процедуры для прогнозирования технологии Oracle Data Mining, которая является частью пакета DBMS_PREDICTIVE_ANALYTICS.

Стоит отметить, что данная процедура принимает на вход только название таблицы, содержащей обучающую выборку, и подбирает параметры модели, в том числе и алгоритм, автоматически.

Таблица 1

Результаты оценки ошибок моделей

Алгоритм	Классификация		Регрессия			
	Болезни	Акции	Болезни		Акции	
			RMSE	MAE	RMSE	MAE
Линейная обобщенная модель	0,131	0,233	1766,771	1288,382	0,213	0,142
Линейная обобщенная модель с гребневой регрессией	0,132	0,520	1766,848	1288,504	0,280	0,181
Дерево решений	0,132	0,480	-	-	-	-
Наивный байесовский классификатор	0,153	0,520	-	-	-	-
Машина опорных векторов с линейным ядром	0,127	0,000	1852,090	1309,244	0,231	0,153
Машина опорных векторов с гауссовским ядром	0,130	0,520	2292,842	1948,004	22,655	19,927
Универсальный метод	0,128	0,172	1789,762	1390,731	11,488	10,146
DBMS_PREDICTIVE_ANALYTICS. PREDICT	0,289	0,382	1685,300	1070,462	0,207	0,150

Из таблицы 1 видно, что для решения задачи классификации универсальный метод находиться на втором месте по точности, уступая машине опорных векторов с линейным ядром. В случае прогнозирования динамики фондового рынка на примере цен акций компании General Electronic мы видим нулевую ошибку, что на первый взгляд кажется идеальным результатом, но на самом деле это пример проблемы переобучения. В данном случае, закономерность, найденная алгоритмом машинного обучения, распространяется не только на обучающую выборку, но также и на тестовую. В данном случае, прогноз все равно является точным, но не для всех данных он будет абсолютно безошибочным.

Также отметим, что процедура DBMS_PREDICTIVE_ANALYTICS.PREDICT, которая выбирает и настраивает модель автоматически, основываясь на обучающей выборке, показывает менее точный результат, чем полученная модель.

Теперь рассмотрим оценки ошибок для моделей, решающих задачу регрессии.

Наилучший результат у встроенной процедуры технологии Oracle Data Mining DBMS_PREDICTIVE_ANALYTICS.PREDICT, а наихудший – у модели, построенной на основе машины опорных векторов с гауссовским ядром.

Отметим, что в наихудшем случае величина среднеквадратичной ошибки примерно равна среднему значению прогнозируемой величины, которое составляет 22,465 доллара, в случае прогнозирования конечной цены акций компании General Electronic. Заметим, что второй по возрастанию величины ошибки является модель, построенная с помощью линейного обобщенного алгоритма.

Таким образом, в случае данных об акциях предложенный в данной работе метод основан на модели с одним из лучших показателей и самым худшим и его точность является примерно средним значением точностей базовых алгоритмов. Это происходит за счет того, что каждый раз значением прогноза становится среднее значение из результатов двух базовых алгоритмов, и тем самым значение с большим отклонением компенсируется значением с меньшим, и значение с меньшим отклонением отклоняется еще больше за счет значения с большим.

Данная проблема, также, наблюдается и в случае оценки рисков кардиологических заболеваний, но в менее явном виде. Это связано с тем, что величина среднеквадратичной ошибки в случае модели, с наихудшим алгоритмом – машиной опорных векторов с гауссовским ядром, составляет всего 30% прогнозируемой величины,

что равно 7498,530 дням, а не находится с ней в равенстве.

Таким образом, метод композиции алгоритмов для решения задачи прогнозирования, основанный на двух противоположных по природе алгоритмах машинного обучения, таких, как обобщенная линейная модель и машина опорных векторов с гауссовским ядром, увеличивает точность базовых алгоритмов в случае решения задачи классификации, и компенсирует точность базового алгоритма с меньшим показателем точности за счет второго базового алгоритма, точность которого выше.

Кроме того, данный метод сохраняет свойства композиционного агрегирования результатов нескольких базовых алгоритмов, построенных на основе различных подмножеств элементов обучающей выборки, такие как устойчивость к исходным зашумленным данным и к переобучению.

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SECTION 20. Medicine.

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DIFFERENT PATTERNS OF LIMB INJURIES IN VICTIMS OF MOTORBIKE ACCIDENTS

Abstract: *Objectives: It is a retrospective study. This study was conducted to analyze Accidents by two-wheel vehicles reported to a single hospital in twelve months duration. In this study injuries to the limbs were observed in relation to different zones of limbs. Different pattern of injuries were studied in driver and pillion rider and results were compared.*

Methods: All information and data collected from documents of hospital records. Various anatomical zones were assigned to the limbs and injuries were studied according to these zones. Trauma of diver and pillion rider were analyzed and compared with each other.

Results: Between 1st Jan 2017 to 31st December 2017, 240 two wheeler accidents were recorded. 110 had injuries of limbs. Results were obtained from Bahawal Victoria Hospital Bahawalpur Punjab Pakistan. 85 cases were added in the study cases and of these 60 were drivers. Skid and fall injury was the most common mode of injury of the vehicle. Pillion riders had injuries mostly in accidents between motorbikes and four wheeler vehicles. In drivers mostly wrist and hand regions of upper limb were involved and in the lower limb the tibia and ankle regions. In the pillion rider, tibia and ankle were involved in lower limbs whereas shoulder and wrist were mainly injured in lower limbs.

Conclusion: Accidents of motorbikes cause much trauma to the driver and person sitting behind him. Mostly trauma of wrist and tibia were observed among bike-riders. Most of the injuries in upper limb were similar in both groups.

Key words: *Motorbike accidents; epidemiology; limb injuries.*

Language: *English*

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1. Introduction

This study was done in a tertiary care hospital. Use of motorbikes is so common in the city. That is the reason motorbike accidents are mostly involved in accidents. Causative factors of these accidents are use of sedative drugs by the drivers, overloading and not following traffic rules.

A study was done in India on the accidents and use of helmit.[1] There are few researches based on the pattern of limb injuries as done in this study. In Jamaica a study was done on the trauma of motorbike riders. He studied that ignorance of safety measures cause serious injuries of limbs.[2]

They concluded that upper and lower limbs were commonly injured. Majority of victims were male. Many of these victims were operated for trauma. Most of the cases got minor trauma.

A similar study was done in Nigeria,in which victims of motorbike accidents were studied, contributing 18% of all road traffic accidents. In 13.5% cases articulated vehicles were involved. Remaining accidents caused by buses and motorbikes. 68% patients were pillion riders. They got collision with cars.[3] In 50% patients tibial fracture occurred which was very common injury among the victims.[4]

A similar study done was in Western Maharashtra analyzed and various modes of injuries studied in road accidents. Following findings were recorded.[5] Most of the victims were males having age of 20-29 years. Those falling in young age group account 10% of total victims. Accidents due to motorbikes account 35% of all road accidents. In all the pedestrian victims, 32% got trauma from motorbikes. In this study one hundred and ninety fractures were recorded. Majority fractures of tibia (46.3%), on second number fractures of upper limbs (24.7%) and then skull fractures. Most of the studies conclude that upper limbs injuries are more common than those of lower limbs in motorbike accidents. In a study by Jha et al, maximum victims were males (83%) and most of them were labourers.[6] About 31% of the vehicles were motorbikes causing accidents. Majority of victims were below 30 years. Victims of age less than 10 years were 35% of all injured. Pedestrians, drivers and those having vehicles account 22%, 35% and 45% respectively. People using bicycle were in more number than using motorbikes. Among them pillion riders were in least number.

Another study done in Calabar concluded that motorbikes account 63% of all accidents.He also reported that injuries to lower limbs were more than upper limbs.

Most of the victims were having open fractures. Among them 50% victims got multiple fractures.

Another study was done in india about road traffic accidents by motorbikes.[6] No study done in Pakistan on this topic in detail ever. Above studies show prove that most of the road traffic accidents occur due to motorbikes all over the world.

In this study all those victims of motorbike accidents recorded who presented in accident and emergency department of B.V Hospital Bahawalpur Pakistan.

2. Materials and Methods

This is a retrospective study. This study was done to determine pattern of limb injuries reported in orthopedic unit of Bahawal Victoria Hospital Bahawalpur. Data collected about victims of motorbike accidents in relation to driver and pillion rider. Data of both groups compared with each other. All data was documented on a designed proforma. The study duration was from 1st January 2017 to 31st December 2017. Only those victims were included in the study which got trauma while driving motorbike or they were sitting behind the driver on the bike. Those were excluded who were not injured. Accidents by four wheelers were not included. Information gathered from official documents of the hospital. Record of accidents during the mentioned period of twelve months, was obtained from registers. Which cases were falling in the criteria were included and all other cases were excluded. A written permission was taken from Medical Superintendant of the hospital. The data was put in a systemic manner and composed in a format. Upper and lower limbs were assigned different zones. Data was classified according to the zones of injury and data was expressed in the form of tables and charts and compared with each other. Software used to compose data was Microsoft office version 2007.

3. Results

Casualty records were analysed for the period 1st Jan 2016 to 6th Jan 2017. 310 road accidents were observed during this period. Of these 240 involved two wheelers. One hundred ten cases had limb injuries associated with fractures in this group. Fifteen patients of this group had insufficient data available on record to justify addition to the data sheet. Eighty Five cases were eventually included in to the study protocol. There were 60 drivers and the rest were pillion riders.

The mode of injury was most commonly skidding and fall of the two wheeler. Thirty Eight of 85 patients had injury due to this mode (44.7%). The next more common mode of injury was a collision between a four wheeler and a two wheeler (28 cases, 32.9%). Other modes of injury seen were collision be-tween two wheelers, a collision between a two wheeler and a stationary object and between a two wheeler and a three wheeler. The rider (driver) was more commonly injured in a skid and fall followed by a two wheeler to a two wheeler collision. The commonest mode of injury for a pillion rider was a collision between a two wheeler and a four wheeler (11 cases, 44 percent), closely flowed by a skid and a fall injury (32%) (table 1).

Table 1

Different modes of injury

Mode of injury	Driver	Pillion
Collision of motorbike with a static object	1 (1.6%)	0 (0 %)
motorbike to motorbike	11 (18.3%)	4 (16%)

Motorbike to three wheeler vehicles	1 (1.6%)	2 (8%)
motorbike to four wheeler vehicles	17 (28.3%)	11 (44%)
Slip and fall from motorbike	30(50%)	8 (32%)
Total	60	25

Eighteen open fractures recorded in victim drivers (30%) while 5 open fractures recorded in the pillion riders (28% of pillion rider group). In both groups frequency of open and closed fracture was almost same (table 2).

Table 2

Open and closed fracture in the drivers and pillion riders

	Driver	Pillion
Open fracture	18 (30%)	5 (28%)
Closed fracture	40 (66.6%)	20 (80%)
Both open and closed fractures	2 (3.3%)	2 (8%)
Total	60	25

When data was compared it was observed that mostly zone-3 of upper limb got trauma (34.48%) while in both lower limbs zone-4 was involved (38.81%). So we can say that mostly injured parts of the body in the drivers were wrist, hands, ankle and foot. (Table- 3&4).

Table 3

Fractures of upper limbs in relation to the zones of injury

	Driver	Pillion Rider
Zone I	8 (13.3%)	2 (8%)
Zone II	10 (16.6%)	1 (4%)
Zone III	8 (13.3%)	4 (16%)
Zone I & Zone II	4 (6.6%)	-
No upper limb injury	30(50%)	18 (72%)

Table 4

Fractures in different zones of lower limbs

	Driver	**Pillion rider**
Zone I	1 (1.6%)	0 (0%)
Zone II	1 (1.6%)	5 (20%)
Zone III	4 (6.6%)	2 (8%)
Zone IV	23 (38.3%)	8 (32%)
Zone V	1 (1.6%)	3 (12%)

Zone I & Zone II	2 (3.3%)		
Zone II & Zone IV	1 (1.6%)		
Zone III & Zone IV	2 (3.3%)		
Zone IV & Zone V	1 (1.6%)		
No lower limb injury	24 (40%)	2	(8%)
Zone V		2	(8%)
Zone II, Zone III & Zone IV		2	(8%)
Zone I, Zone III & Zone IV		1	(4%)

Data obtained about pillion riders showed that in upper limbs only zone-1 and 3 were mostly involved and in lower limbs zone-4 was involved commonly. Hence mostly tibia and ankle fractures occurred in the legs and shoulder and wrist in upper limbs. It was observed that drivers got more injuries than pillion riders as expressed in table-3&4. Six of them got trauma of lower limbs and 4 of them in the upper limbs. While just 3 victims recorded from pillion riders with multiple fractures. In both categories trauma of lower limbs was more common than upper limbs. The extent of trauma could not be evaluated.

4. Discussion

Accidents by motorbikes are very common in Asian and European countries.Many Studies on this topic have been done in other countries.[5-7] Indian authors Jha and patil have done similar study.[5,6] Eighty five cases were falling in the criteria including 60drivers 25 pillion riders. Drivers were injured more than pillion riders. Drivers got trauma of upper and lower limbs. Most of the fractures recorded were open in nature. Complicated injuries involving both upper and lower limbs were common in drivers of motorbikes. They got mostly trauma of wrist and shoulder regions and ankle and tibia. There were different modes of injuries recorded in which trauma due to fall and slip of bikes was more common. Mostly accidents happened between motorbikes and motorbikes with cars and other four wheeler vehicles. Data showed that drivers of motorbikes got severe trauma as compared to drivers of cars and four wheelers. They got multiple injuries and fractures. Fracture of legs was found in higher number. Its main reason was lack of safety measures. Law on this issue has been made to take proper measures of safety before driving but issue is that it is not implemented or not followed by the citizens. There is much lack of awareness among the people about these measures. There should be awareness programmes on this issue in schools, colleges and universities. Strict implementation of traffic rules and regulations can decrease these accidents. Due to some deficiency of available records and limitations of the hospital, we could not increase sample size. This study can help us to understand different modes of injuries in the accidents of two wheelers. We may predict that which body parts are more likely to get trauma and hence we can safety measures regarding this. By increasing sample size of this study and parameters we can further get much useful information. It is suggested that all cases of trauma reported in hospitals should be documented properly on computers in a proper format so that this data should be used in future for research work and to increase facilities of the hospital. History, examination points, investigation result and treatment taken by the patient, admission, discharge and follow up all data should be recorded.

5. Conclusion

Motorbikes are mostly involved in road traffic accidents and. Most of the trauma in the accidents is due to motorbikes collision with other vehicles. A person driving a bike gets severe trauma during accident than the person sitting behind him on the bike. Mainly upper and lower limbs are injured than other parts of the body. Trauma of tibia, ankle, shoulder and wrist is common.

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Appendix 1

Upper limb:

Zo**ne 1**: Shoulder+ arm (clavicle + acromio-clavicular joint + shoulder girdle + shaft of humerus ; **Zone 2**: Elbow joint + forearm (lower end of humerus + Radius, ulna ex-cluding wrist); **Zone 3**: Wrist + hand

Lower limb:

Zone 1: Pelvis; **Zone 2**: Hip bone + proximal part of femur + shaft of femur ; **Zone 3**: Distal part of Femur and knee joint; **Zone 4:** Tibia and Ankle ; **Zone 5**: Foot.

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SECTION 29. Literature. Folklore. Translation Studies

THE NOTION OF MACROPHRASING IN TEXT LINGUISTICS

Abstract: *The article deals with the overview of the peculiarities of understanding the notion of macrophrasing in text linguistics. Different approaches to the interpretation of the notion of phrasing are given. The description of the main aspects of macrophrasing in terms of the structure of the verse is provided.*

Key words: *macrophrasing, text linguistics, composition, image, context.*

Language: *English*

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Introduction

Structural linguistics as one of the most interesting areas of text linguistics in the field of the literary works analysis is a set of views on the language and methods of its study. It is based on the understanding of language as a sign system with clearly distinguished structural elements and a tendency to exact formal language description [12, 496]. The depth and surface text structures detection is possible within these scopes. However, it should be taken into consideration that there have been certain differences in the structure of poetry and any other literary text.

In prose, units of lower levels are included in units of such higher ones as phonemes that consist of distinctive features, e.g. syllables are divisible into phonemes, tacts – into syllables, colas – into tacts. It is had to be the same with meaningful forms: the words which are composed of morphemes, sentences – from words, supra-phrasal unities – from sentences. However, the poem, as the most important compositional unit that possesses usual and occasional semantics, has the ability to "cut" into parts the units of lower levels. The border of the verse often passes within the sentence, phrase, word or morpheme (sometimes within the tact or syllable). However, it can not be said that the verse is "composed" of them. The movement of a word, a morpheme or even a syllable from one line to another is just a rhythm modulator. Sound, intonation, syntactic, lexico-semantic language means are involved in the formation of the rhythm [12, 416]. Thus, it is reasonable to say about the engaging of the voice in the process of cognitive study of the poetry, and this requires an appeal to the notion of text phrasing.

The purpose of our article is the overview of the notion of text phrasing in the field of text linguistics.

Materials and Methods

The Old Greek notion of the frazis "covered the language in the general sense, the construction of the language, and the personality of its exteriorization" [9, 72]. The notion of phrase, according to the Dictionary of foreign language words by I.V. Leochina and F.N. Petrova, is a complete turn of speech or a sentence [8, 700]. At the same time, according to V.N. Yartseva, the broader meaning of the phrase is given. A phrase is distinguished as the basic unit of speech expressing the complete idea, the content unity, the integrity of which is created by intonational means, as well as a certain syntactic structure [12, 558]. The notion of phrasing can be found in the Dictionary of linguistic terms by O.S. Akhmanova, which is defined as the application of super-segmental phonetic means (pause, tempo, etc.) for expressive reading [1, 504]. Very similar definition of the phrase is given in the work by O.V. Aleksandrova and T.N. Shishkina's: "fragmentation is a use of suprasegmental phonetic means and a placement of pauses in the speech streaming chosen by the speaker"[2, 21].

Thus, we can observe the gradual narrowing of the framework of the notion of phrasing. We focus on the hermeneutical content of the notion of

phrasing which is necessary to restore the completeness of understanding. In the article by N.P. Neborsina it is proved that the cognitive-poetic content of the category of phrasing that consists of: "1) the appearance of language (speech phenomenology); 2) formal language (rhetorical implementation); 3) generic comfort language (the choice of emotional and psychological colour)" [9, 74]. This interpretation of the phrasing is the most suitable for its study in terms of text linguistics and rhetorical hermeneutics.

As the example for the aforesaid statement the poem by T. Moore “A reflection at sea” is analysed [5, 20].

See how, beneath the moonbeam’s smile,
You little billow heaves its breast,
And foams and sparkles for awhile, –
Then murmuring subsides to rest.

Thus man, the sport of bliss and care,
Rises on Time’s eventful sea;
And, having swelled a moment there,
Thus melts into eternity.

The poem is divided into two stanzas, where the first stanza is practically entirely devoted to the sea (except for the comparison of the wave that arises, with the chest of man), and the second stanza is used for the description of the man. The author's distribution of the poem on the lines coincides with the rhetorical distribution of the poem in time of reading. The general idea of this poem is represented by the next lexemes: *billow*, *man*, *eternity*. The author of the poem associates the human "eternal" life (generation after generation) with the eternity of alternating waves in the sea. We can even speak about the concept of eternity, which is emphasized in the poem by the capital letter in the sixth line.

Literary work as a specific form of the existence of fiction has a systemic character. Significantly, the ideological and aesthetic systematicity is determined by the image structure of the work and the relations of interaction between different types of images [6].

Thus, we study the literary work in terms of its image structure. We understand images as certain verbal ones (tropes and various syntactic figures) and larger semantic units of the literary work, poetic images [7, 178], that include figures of people, animals (images-characters, narrators) and their natural (images-landscapes) or real-life (images-interiors) environment.

In terms of size and place in the work, three types of poetic images are distinguished: 1) micro-image is the smallest elementary artistic value as the initial unit of figurative artistic thinking measurement, in which an artistically depicted a small particle of being exists (It can be expressed in one sentence, paragraph, or even a superphrasal unity); 2) macro-image, which is a hierarchically higher integral verbal-artistic value, the structure of which may include closely related, homogeneous micro-images; 3) mega-image is a system of macro-images (with their constituent components – microforms) and individual micro-images that appear as separate art details and have their own functions in the literary work [6].

As an example of the aforesaid structure, we analyse William Wordsworth's poem "Gipsies" [11, 171].

Yet are they here the same unbroken knot
Of human Beings, in the self-same spot!
Men, women, children, yea the frame
Of the whole spectacle the same!
Only their fire seems bolder, yielding light,
Now deep and red, the colouring of night;
That on their Gipsy-faces falls,
Their bed of straw and blanket-walls.
– Twelve hours, twelve bounteous hours are gone, while I
Have been a traveller under open sky,
Much witnessing of change and cheer,
Yet as I left I find them here!
The weary Sun betook himself to rest; –
Then issued Vesper from the fulgent west,
Outshining like a visible God
The glorious path in which he trod.
And now, ascending, after one dark hour
And one night's diminution of her power,
Behold the mighty Moon! this way
She looks as if at them – but they
Regard not her: – oh better wrong and strife
(By nature transient) than this torpid life;
Life which the very stars reprove
As on their silent tasks they move!
Yet, witness all that stirs in heaven or earth!
In scorn I speak not; – they are what their birth
And breeding suffer them to be;
Wild outcasts of society!

The mega-image in this poem is the Gypsies themselves; macro-images are men, women and children of gipsy, and micro-images are details of the description of the Gipsies themselves and their lifestyle. But such a clear division into images is not final and it does not have a general tendency that can be applied to any other poetic work.

It is also necessary to pay attention to the distribution of the context – the communicative environment and the environment of the text unit, which specifies its meaning within the general content of the text (the division on micro-context and macro-context). The first notion is understood as the minimal surrounding of the text unit. Macro-context refers to the communicative surrounding of a text unit, which allows one to define its function in the text as a whole [3, 91]. For example, let us take a sentence from the verse "Feelings of a Republican on the fall of Bonaparte" by Percy Bysshe Shelley: “*I hated you, fallen into a tyrant!*” [10, 10].

Providing that the title of the poem is unknown we pay attention to the lexical unit "tyrant". If the context consists only of this sentence, then it is difficult to understand the meaning of this lexical unit in this verse. It is necessary to involve macro-context and pay attention to the title and the full text of the verse. Then the reader can see that the lexical unit “tyrant” in this case is completely associated with Bonaparte.

Corresponding to the distribution of poetic images into macro- and micro-images, it is possible to extract and study the features of macro-fragmentation of the verse. The notion of macrophrasing is much broader than just the notion of the phrasing of the verse. It includes both external and internal sides.

Let us consider the composition of the poem “Home-thoughts, from abroad” by Robert Browning [4].

I

Oh, to be in England
Now that April's there,
And whoever wakes in England
Sees, some morning, unaware,
That the lowest boughs and the brush-wood sheaf
Round the elm-tree bole are in tiny leaf,
While the chaffinch sings on the orchard bough
In England – now!

II

And after April, when May follows,
And the whitethroat builds, and all the swallows!
Hark, where my blossomed pear-tree in the hedge
Leans to the field and scatters on the clover
Blossoms and dewdrops – at the bent spray's edge –
That's the wise thrush; he sings each song twice over,
Lest you should think he never could recapture
The first fine careless rapture!
And though the fields look rough with hoary dew,
All will be gay when noontide wakes anew
The buttercups, the little children's dower
– Far brighter than this gaudy melon-flower!

The verse is clearly divided into two stanzas, each one is numbered. There are four exclamation marks that tell us about the exalted spirit of the poem. The first stanza is written in the present time, and there is a gradual transition from the present to the future time in the second stanza. It shows the gradual awakening of England in the spring. The text of the verse depicts only two months of spring, but due to the smooth transition in the last four lines from the use of the present time to the future one, and then, in general, to the complete absence of a verb replacing the dash, it is possible to notice the following summer months, they have not yet come, but their appearance is predictable. Furthermore, the first and second stanzas are linked by a conjunction “and”, which emphasizes the smooth transition from one month to another.

As for the architectonics of the verse, it is completely connected with the external structure and is expressed through certain stylistic figures and tropes. In the poem, we encounter such tropes as metaphor (*hoary dew; wise thrush; ... when noontide wakes anew the buttercups ...*), epithet (*the lowest, tiny, careless, little, fine, gaudy*) and comparison (*fields look rough*). Also, in the text of the poem, we encounter four exclamation marks that represent four rhetorical exclamations. In addition, in the verse the anaphora (“And after April, when May follows,// And the whitethroat builds, and all the swallows!”) and ellipsis (*“The buttercups, the little children's dower // – Far brighter than this gaudy melon-flower!”*) are presented. It should be mentioned that these syntactic shapes and tropes express the inner side of the verse. These stylistic devices are used to express the peculiarities of the psychology and aesthetics of thinking of the poet.

Conclusion

Consequently, the external side (composition) of the verse is represented by the structural and grammatical features of the verse, while the internal one (architectonics) is verbalised by rhetorical, aesthetic and psychological peculiarities. Therefore, in order to understand any poem in its entirety, it is necessary to pay attention to the components of the external and internal sides of the poem, but first of all, one must understand the connection between them and the hermeneutical research of literary texts in general.

Thus, it should be concluded that phrasing is always individual, since the perception of the text is carried out by readers with different levels of knowledge, experience and various psychological differences; therefore, the perception of the text purpose of interpretation requires the intensification of all these individual characteristics and the continuous concentration of attention on the text as an object of interpretation.

The peculiarities of macrophrasing of the verse are closely dependant on the diversity of the composition and the architectonics, which will be the objects of the further investigations.

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SECTION 30. Philosophy.

SELF-ORGANIZATION IN THE CONTEXT OF EPISTEMOLOGY

Abstract: *The process of cognition is a relentless search for new methods and approaches to the knowledge of a complex, diverse world. The vector of the development of the cognitive apparatus is aimed at the knowledge of a more complex, interrelated, interdependent world, the formation of new methods of methodological guidelines. Increasing complexity of the surrounding world poses a problem on what the behavior of complex systems depends?*

The concept of self-organization, emerged as an interdisciplinary approach, shows that in the world all are interconnected, interdependent. This article analyzes the problems of self-organization in the process of cognition (epistemology).

Key words: *autopoiesis, autopoiesis, autophagy, system, dissipative system, approach, disciplinary approach, system approach, interdisciplinarity, interdisciplinary approach, cognition, self-organization, synergetics, synergetic approach, complex systems, structure.*

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САМООРГАНИЗАЦИИ В КОНТЕКСТЕ ЭПИСТЕМОЛОГИИ

Аннотация: *Процесс познание – это неустанный поиск новых методов и подходов познании сложного, многообразного мира. Вектор развития познавательного аппарата направлен на познание усложняющегося, взаимосвязанного, взаимообусловленного мира, формированием новых методов методологических установок. Все возрастающая сложности окружающегося мира ставит проблему от чего зависит поведение сложных систем?*

Концепция самоорганизации, возникла как междисциплинарный подход, показывает что в мире все взаимосвязаны, взаимообусловлены. В этом статье анализируется проблемы самоорганизации в процесс познание (эпистемологии).

Ключевые слова: *аутопоэзис, аутопоэзной систем, аутофагии, система, диссипативная система, подход, дисциплинарного подхода, системный подход, междисциплинарность, междисциплинарный подход, познания, самоорганизации, синергетика, синергетический подход, сложные системы, структура.*

Введение.

Современный познавательный аппарат в соответствии с изучением нелинейных процессов природы пополнился теорией сложных систем (синергетика), которая позволяет исследовать неисследованные стороны нелинейного мира. Законы, закономерности отражающие процессы линейного мира пополнились новыми научными методами, подходами нелинейного мира. Изучение этого мира не продуктивно в аспекте только дисциплинарного подхода, который дополняется междисциплинарным подходом. Так, например, синергетический подход, в столь разных по природе живой и неживой природе позволил установить нечто общее между ними.

Основная часть.

Процесс образования новых структур в открытых системах подчинены общим закономерностям. С точки зрения синергетики и творческие возможности предстают в новом виде. «В мозге происходит своего рода фазовый переход, множество прежде никак не связанных между собой детали неожиданно становятся частицами вполне упорядоченного и преисполненного глубочайшего смысла единства

речь в данном случае идет о процессах аналогичных тем, что уже известны нам из других областей синергетики. В результате той или иной флуктуации («озарения» или вспышки) возникает новый параметр порядка (новая идея) благодаря которой нам и удаётся найти взаимосвязь между отдельными деталями и упорядочить их, подчинив себе. Однако все это происходит благодаря самоорганизации – самоорганизации наших мыслей в данном случае» [12, с.232]

Синергетика, как междисциплинарное направление е научных исследований позволяет исследовать общие закономерности процессов перехода от хаоса к порядку и обратно в открытых нелинейных системах физической, химической, биологической, экономической, социальной и других сферах. «Междисциплинарность означает прежде всего, кооперацию различных областей, циркуляцию общих понятий для понимания некоторого явления» [2, с.28]

Междисциплинарность содружество различных наук, стремящихся решить свои проблемы совместно, но при этом отдавая приоритет конкретной дисциплинарной науке. Так, например Э. Морен отмечает, что «междисциплинарность может просто означать только и просто то, что различные дисциплины садятся в ООН исключительно для того чтобы заявить о своих собственных национальных правах и своем суверенитете по отношению к посягательствам соседа. Но междисциплинарность может стремится к обмену и кооперации, в результате чего междисциплинарность может становится чем-то органическим» [8, с.133]

Одним из локомотивов развития современной науки является междисциплинарный подход, который имеет возможность, как для углубленного так и для расширения научных исследований.

Концепция самоорганизации, возникла как междисциплинарный подход, основываясь на то, что в мире все на идеи, взаимосвязано, взаимообусловлено.

Основу синергетического подхода составляет системной подход. «Синергетика опирается на очень разные дисциплины, среди которых не только физика, химия и биология, но и также социология и экономика, можно поэтому ожидать, что открытые и описанные синергетикой закономерности уже так или иначе будут представлены в различных областях науки, и у нас появится возможность увидеть возникновение в свете синергетики новой, единой картины мира, составленной, подобно мозаике, из множества отдельных, собранных наукой фактов» [12, с.25]

Объект изучения синергетики – механизм перехода хаоса в порядок, процесс самоорганизации, обуславливающий возникновение нового.

Устойчивость и неустойчивость, порядок и хаос являются компонентами, которые составляют основу синергетической картины мира.

В истории науки представления об основах, составляющих основу мироздания можно проследить в основном два направления. Консервативная система, в которой считалась, что существует первичный элемент не подверженный изменениям (Фалес и др.). Данная концепция составляла основу классической науки. Результаты исследований свидетельствуют о том, что наряду с тем, что система консервативна она еще обратима во времени [9, с.60]

Платон был убежден в том, что постоянство так и изменчивость являются составными частями реальности. По Гераклиту реальность есть процесс, арена борьбы и самоорганизации разных сущностей. «Этой космос, тот же самый для всех, не создал никто из богов, ни из людей, он всегда был, есть и будет вечно живым огнем, мерами разгорающимся и мерами погасающим» [7, с.8]

Проблема самоорганизации живых систем, как подчеркивает Ф.Капри в кн. «Паутина жизни. Новое научное понимание живых систем», рассматривалась и в философии И.Канта. Его идеи в какой-то степени идентичны современным воззрениям на процесс самоорганизации в живых системах. В произведении «Критика практического разума, он подчеркивает что, организмы в отличие от машины, представляют собой самовоспроизводящиеся, самоорганизующиеся целостности. В машине, согласно Канту, части существуют только друг для друга в смыли поддержки друг друга в рамках функциональной целостности. В организме части существуют часто с помощью друг друга в смысле создания друг друга» [1]

Идеи о взаимосвязи, взаимозависимости можно найти в этих концепциях, но преобладает консерватизм. Но эти абстрактные идеи были лишь умозрительными рассуждениями или индуктивными догадками, ни теоретической ни экспериментальной базы не было.

Второй подход – диссипативная система. Она не консервативна (энергия в ней не сохраняется), а открыта. Обычно оно содержит внешний управляющий параметр, который можно менять и прослеживать переход к хаосу» [4, с.84]

Исследуя переход от нормального света к лазерному, Хакен понял, что этот переход служит

примером самоорганизации систем далеких от равновесия.

Что такое самоорганизация, какую систему можно назвать самоорганизующейся?

По мнению Г.Хакен, самоорганизующаяся система «если она без специфического воздействия извне обретает какую-то пространственную, временную или функциональную структуру. Под специфическим внешним воздействием мы понимаем такое, которое навязывает системе структуру или функционирование. В случае же самоорганизации система испытывает извне не специфического воздействие. Например, жидкость, подогреваемая снизу, совершенно равномерно обретает в результат самоорганизации структуру, образуя шестиугольные ячейки» [11, с.28].

В самоорганизующихся системах без специфического воздействие используются внутренние возможности в результате действия которых возникают более сложные и более совершенные структуры. Понятие «структура», указывает на упорядоченность системы, показывающая относительную устойчивости между элементами системы. Динамика системы определяется ее структурой. Для формирования новых структур система должна быть: далеко от равновесного состояния; необходим непрерывный поток материи и энергии сквозь систему; нелинейная взаимосвязь между элементами системы, которая характеризуется функционированием петли обратной связи. Образование новых структур и их функционирование происходит в процессе развития, обучения и т.д. Почему? Формирование и функционирование новых структур показывает адаптационные возможности системе. Возникновение новых структур, дает возможность системе адаптироваться и окружающей среде, т.е. системе реагирует на изменение внешней среды. Все это определенных условиях приводит к качественным изменением системы. Структурные изменения его времени могут привести к распаду системы, а альтернатива структурные изменения основа совершенствование системы, т.е. структурные изменений основа качественных преобразоваться системы, их можно рассматривать как эволюцию системы.

Изменение структуры, возникновение новых структур являются всеобщей закономерностью, как в области неживой, живой и ментальных сферах.

Систем, происходит за счет постоянного прохождения через них потока энергии и вещества. «Знакомыми примерами являются живые системы, такие как растения и животные, которые питаются» биохимической энергией. Процесс переработки этой энергии может приводить к образованию макроскопических структур – рост растений, миграции животных и т.д. Однако такое возникновение порядка никоим образом не присуще только живым системам. Этот тип диссипативности (необратимой) самоорганизации вдали от термодинамического равновесие, которой можно найти не только в биологии, но и в физике, и в химии» [7, с.92-93].

Необратимость в классической термодинамике всегда ассоциировалась с рассеянием энергии и потерями. Диссипативные структуры по Пригожину показывают, что в живых системах функционирующих в условиях, удаленных от равновесия необратимость играет конструктивную роль. Формирование и функционирование диссипативных структур – показывают, стремление системы и устойчивому состоянию, происходит при условии постоянного потока энергии и есть своеобразный синтез порядка и хаоса. Устойчивость системы осуществляется за счет порядке в системе и хаоса в окружающей среде.

Образовавшиеся равновесных системы можно изолировать и поддерживать долгое время без дальнейшего взаимодействие с внешней средой. Как подчеркивает И.Пригожин «вдали от равновесия могут спонтанно возникать новое типы структур. В сильно неравновесных условиях может совершаться переход от беспорядка, теплового хаоса и порядку. Могут возникать новые динамические состояния материи, отражающие взаимодействие данной системы с окружающей средой. Эти новые структуры мы назвали диссипативными структурами, стремясь подчеркнуть конструктивную роль диссипативных процессов в их образовании» [10, с.21].

Понятие диссипативной структуры подчеркивает «тесную и на первый взгляд парадоксальную взаимосвязь, существующую в таких ситуациях, с другой стороны между структурой и порядком, а с другой между диссипаций или потерями в классической термодинамике тепловой поток считается источником потерь. В ячейке Бернара тепловой поток становится источником порядке» [10, с.133].

В отличие от равновесной системы диссипативная системе не консервативна, она «открыта», т.е. она через ряд последовательных самоорганизаций усовершенствует свою структур. Структура, как вид организации и связи между элементами может изменяться, которые влияют на функциональные возможности системы.

«Винер и его коллеги считали обратную связь существенным механизмом гомеостаза – саморегулирования, которое позволяет живым

организмам поддерживать себя в состояние динамического равновесия» [1, с.59]. Существование двух видов обратной связи отрицательной (дающая возможность сохраниться системе) и положительная (проводящая и изменениям) позволят системе изменятся в зависимости от условий.

Диссипативные структуры, их образование и функционирование, доминируется сочетанием порядка и хаоса. Возникновение порядка в системе достигается за счет увеличения беспорядка в окружающий среде т.е. уменьшение энтропии в такой системе связано с увеличением беспорядке в окружающей среде. Обратная связь в диссипативной системе является источником возникновения новых структур, новой сложности. По концепции И.Пригожина, не только поддерживают свое устойчивое состояние вдали от равновесие, но имеют возможность развиваться. Идей процесс самоорганизации, когда в отличие от первичных возникают более сложные и более совершенные структуры.

Согласно У.Матурана и Ф.Варела «живые существа характеризуется тем, что постоянно самовоспроизводятся, именно на этой процесс самовоспроизводства мы указываем, когда называем организацию, отличающую живые существа, аутопоэтической организацией» [6, с.12]. Аутопоэзис присущ всем живым системам, независимо от их классов, компонентов. По мнению У.Матурана, «живая система имеет круговую организацию, она является единством взаимодействий, и именно эту кругообразность живая система должна сохранять, чтобы остаться живой системой со совершенственной ей идентичностью в различных взаимодействиях а идентичность свою она сохраняет лишь до тех пор, пока фундаментальная кругообразность, определяющая живую систему в качестве единства взаимодействий, остается не нарушенной» [5, с.24]. Благодаря замкнутости каузального круглого процесса, живая система допускает изменения для поддержание кругообразности, но при этом сама кругообразность остается.

У.Матурана и Ф.Варела проводят различие между организаций и структурой, структура не рассматривается как некоторой вид организации.

«Организация означает те отношение, которые должны существовать, чтобы ее можно отнести к определенному классу» [6, с.12]. Организация определенная конфигурация взаимоотношений между элементами единства и окружающей средой. Одна и та же организация может быть присуща различным представителем одного и тоже класса объектов. Она не зависит от свойств компонентов её составляющих, они могут быть различными. Главное отношения между компонентами должны быть в виде замкнутого каузального кругового процесса, т.е. они представляют отрицательную обратную связь, которая служит сохранению постоянства системы.

Концепция У.Матурана и Ф.Варела – новая системно-теоретическая концепция о самовоспроизводящихся системах. Самовоспроизводящиеся системы, состоящие из компонентов и отношений, способны воспроизводить и компоненты и связи между ними, с помощью лишь собственных действий, т.е. эти действия, относятся только к самой системе но не к внешнему миру. Система постоянно производит, воспроизводит, создать саму себя. В аутопоэзной системе воспроизводство и создание новых осуществляется компонентами самой системы. Поэтому организационная закрытость означает, что живая система самоорганизующаяся, поскольку ее порядок и поведение обусловлены самой системой. Но в тоже время система взаимодействует с окружающей средой, идет непрерывный обмен энергии и материи. Взаимодействие с окружающей средой не определяет организацию, она остается самоорганизующейся. Но постоянное взаимодействие с окружающий средой создает условия для формирования новых структур. «Создание новизны приводящий к развитию и эволюции, является глубоким внутренним аспектам аутопоэзиса. У.Матурана и Ф.Варела видят в различии между взаимоотношениями статических взаимоотношении и взаимоотношениями процессов ключевую разницу между физическими и биологическими компонентами» [1].

В аутопоэзной системе постоянно происходят структурные изменение, но при этом сохраняется организация, т.е. компоненты непрерывно или периодически распадаются и возникают, уничтожаются и создаются.

Так циклические изменения можно увидеть на таких примерах, как наша поджелудочная железа заменяет «большинство своих клеток каждые двадцать четыре часа, наши белок кровяные тельца обновляются за десять дней, а 98 процентов протеина в нашем мозге сменяются меньше, чем за месяц. Клетки нашей кожи заменяются со скоростью 100000 клеток в минуту» [1, с.213].

Как отмечает пресс-релиз Нобелевского комитета «Открытия Осума привели к новой парадигме в свое содержание. Его открытие путь к пониманию фундаментальной важности аутофагии для множества физиологических процессов. Таких как адаптация к голоду и ответ на инфекцию». Айтофагия генетически присуща всем живым организмам. Она позволяет клеткам

избавляться от ненужных частей, а организм в целом от ненужных клеток.

Другой тип изменений, приводят к образованию новых структур – новые связи в аутопоэзной систем. «Изменение второго типа – эволюционное, а не циклические; они тоже совершаются непрерывно, либо как последствия влияния окружающей среды, либо как результат внутренней динамики системы» [1, с.213] Сложная система взаимодействий, система основываясь на циклических изменениях, сохраняет свою идентичность и изменения связаны с изменением структуры для адаптации и условиям внешней среды, сохраняя при этом свою организацию. В данном процессе наблюдается нерасторжимая связь между единство изменчивостью и организацией, различиями и сходствами. По данной концепции структурные изменения играет важную роль, как в сохранении идентичности, так и в адаптационном процессе организации. Структурные изменения, при воздействии извне трансформируются.

Структура, в данной концепции означает «те компонента и отношения, которые действительно составляют конкретное единство» [6, с.13]

«Посредством своей организации живая система определяет область всех взаимодействий, в которые она может вступать без утраты собственной идентичности. … а идентичность свою она сохраняет лишь до тех пор, пока фундаментальная кругообразность, определяющая живую систему в качестве единства взаимодействий, остается не нарушенной» [5, с.32]

Организация определяет область взаимодействий, структура определяет, обуславливает направление взаимодействии. Внешнее воздействие не может изменить, детерминировать системы. Она внутренне детерминирована.

Изменения, происходящие в живом существе, определяются его структурой. “Изменения, проистекающие от взаимодействия живого существа и окружающий его среды, хотя вызываются возмущающим агентом, тем не менее определяются структурой самой возмущенной системой” [6, с.27] Обобщая идею аутопоэзиса можно прийти к заключению, что изменения, происходящие в аутопоэтичний системе есть выражение свойств самой системы, которая реагирует на внешнее воздействия имманентно присущим ей способом. По мнению авторов концепции имеется два положения, которые не соответствуют принципам “классический философии человек оперирует образами мира” и “отрицание окружающей среды” – отсюда вывод солингизм “согласно классической философской традиции существует только внутренняя жизнь каждого”. Но данная концепция вполне самодостаточна и устойчива. “В развернутом виде она дает убедительную картину взаимоотношений между системным единством и окружающей средой, которые характеризают не только процесс познания у живых систем, но и иные процессы, в том числе функционирование над организменных систем” [13, с.170]

Действительно, в познавательном процессе положения аутопоэзной концепции не всегда соответствуют классическим, традиционным подходом гносеологии, представляют новую модель познания. В которой выдвигаются новые установки, новые идеи познавательного процессе, которые в какой-то степени перекликаются с идеями эволюционной эпистемологии «… каждое живое существо начинает с некоторой исходной структуры». Структура определяет направление взаимодействия. Биологическая структура живой системы априорна, она обладает функциональными свойствами. «… великое и фундаментальное открытие Канта: человеческое мышление и восприятие обладают определенными фундаментальными структурами до всякого индивидуального опыта» [3] По Канту, вещи действуя на нас, способствуют возникновению многообразия ощущений, но вместе с этим внутренняя активность пробуждается. В концепции У.Матурана и Ф.Варела структура определяет функционирование системы «изменения, происходящие от взаимодействия живого существа и окружающей его среды, хотя вызываются возмущающим агентом, тем не менее определяются структурой самой возмущенной системы» [6, с.27] Изменения. Происходящие в живых системах, детерминированы их структурой и организацией. «Понятие структурного детерминизма, введенное У.Матураной для понимания биологических систем, нашли применение впоследствии в терапии, психотерапии и даже в изучении социальных систем» [2, с.28]

По концепции У.Матурана и Ф.Варела, во взаимодействие вступают две независимые структуры: живое существо и окружающая среда. Между ними «с необходимостью существует структурная конгруэнтность» - (У.Матурана, Ф.Варела) т.е. между ними существует некий общий код, посредством которого так называя структурная сопряженность т.е. они структурно подогнаны соответствуют друг другу.

У.Матурана считает, что «когнитивная область – это вся область взаимодействий организма», значит увеличивал область взаимодействий мы увеличивает когнитивные возможности организма.

Автопоэзис, это не только поддержание, сохранение, способность регенерации структур, но и также способ её| развития, самообновления. Говоря о познании в аспекте аутопоэзии можно сказать, что оно направлено на поиск того, что упущено. Определял сущность познания. Ф.Варела пишет: «Познание есть действие, направленное на нахождении того, что упущено, и восполнение недостающего с точки зрение когнитивного агента» [[6, с.6]].

Заключение.

В процессе взаимодействия и живая система и окружающая среда обоюдно активны. При наличие общего системы развиваются, адаптируется и внешней среди, изменяется и живая система и окружающая её среда. Их сосуществование обоюдное когда они совместно образуют целое называется коэволюцией. Когда между ними нет структурной конгруэнтности система не выживает.

Количество структурной сопряженности определяет способность системы адаптироваться к изменениям внешней среды. «Многоклеточные организмы имеют больше точек структурной сопряженности со средой, и вследствие этого «становятся возможными многочисленные наследственные линии, использующие разнообразные способы сохранения онтогенетической структурной связи в окружающей среде».

Эпистемологический подход определяет познание сложных явлений, поскольку выявление новых сторон требует новых подходов, новых методологических установок, которые должны адекватно отражать изучаемые явления. (Статья подготовлена в рамках гранта *ОТ-Ф1-95. "*Возможности и перспективы междисциплинарного подхода в исследовании сложных систем*" (2017-2020 гг.).*

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SECTION 30. Philosophy

ATTRIBUTIVE CHANGES IN THE INFORMATION SPACE SYSTEM IN THE CONTEXT OF GEOPOLITICAL COMPETITION

Abstract: *In this article, some aspects and tendencies of the information space system developing especially in the context of geopolitical competition are considered. It is interesting that the result of modern conditions in this context are attributive changes.*

Key words: *Central Asian region (CAR), geopolitics, geopolitical competition, development strategy, information space, information war, attributive changes, information safety, moral and spiritual values.*

Language: *English*

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Introduction

The international importance of Central Asia is due to the geopolitically favorable location between Russia, China, Iran and the Caucasus, significant energy and natural resource potential, transport and transit opportunities, and proximity to the centers of armed conflicts (Afghanistan, Pakistan), which strongly affects international security.

In this regard, the region will remain a sphere of intersection of interests and strategies of both the Central Asian states themselves and external geopolitical players, mainly Russia, the United States, China, the European Union (EU), Iran and Turkey. Determining the prospects for the development of Central Asia depends largely on assessments of current policies and longer-term strategies of these players and other foreign countries that have a decisive influence on the situation and security in the Central Asian region (CAR).

Materials and Methods

Central Asia is a young region, the processes of formation of the institutional structure and the system of international organizations, as well as the search for a cultural and political identity, have not yet been completed. The region is characterized by internal contradictions, significant variability of cultural practices and identities, as well as a wide range of interpretations of the historical heritage.

It should also be noted that the development of the CAR is proceeding against the backdrop of the promotion of diverse, conflicting integration projects, behind which are powerful geopolitical forces.

A distinctive feature of Central Asia is the existence here of a unique combination of challenges and threats of different levels. The situation is exacerbated by the competition of external forces and the lack of cooperation between the Central Asian states themselves, negating all attempts to neutralize the existing risks through international cooperation.

The region has become a hostage of increasing global uncertainty; its dependence on the structure of world politics is a long-term problem, as the balance of forces in the global arena between key external players is constantly changing [1].

From the geopolitical point of view, the security system of Central Asia is a complex construction from several levels (and sublevels), in which different forces are simultaneously involved. In addition, Central Asian states participate in various regional organizations and in the security field are linked simultaneously with several geopolitical centers of power.

Challenges and threats to stability and sustainable development of the states of the region are associated with the influence of many factors; for example, with the aggravation of internal political processes, the activation of extremist and terrorist organizations of various kinds, the growth of Afghan drug trafficking, the problems of migration and marginalization of cities, environmental degradation and water scarcity, increased conflict of

ethnoconfessional nature, etc. All problems related to the security of Central Asia are interregional.

Despite the fact that the place and role of Central Asia in the world community are not defined, the region is gradually drawn into various interregional and global processes, including destructive ones.

Due to the transnational nature of the threats and the low level of independence of each of the states of the region, no country can solve the whole complex of existing problems alone; leveling of threats, strengthening of security, prevention and overcoming of crises in Central Asia can only contribute to the integration of efforts.

However, the prospect of real integration of Central Asia (at least in the models already tested to the present) is very disappointing: antagonism between the countries of the region is too strong; In addition, various Central Asian states are developing in diametrically opposite directions.

By geopolitical competition is understood the rivalry between geopolitical subjects for influence on a particular space, because of which some subjects gain advantages, while others lose it, which affects the state of their security.

The energy principle of the development of the community (state, civilization in general) based on information technology [2] is that the advantages are a system that is structurally organized in such a way that it extracts more energy from a variety of sources for use from the outside. As is known, information (knowledge) is created on the basis of the costs of a number of energy resources (natural, human, technical). Access to this information (knowledge) is incommensurable in terms of energy costs with the process of creating them. At the same time, the released own resources are directed to creating a technological and economic separation from competitors. Those countries that created mechanisms for obtaining the necessary knowledge (information) from the outside could actually turn information donors into some sort of "neocolonial" formations of the information society. An example is the organization by a number of Western countries of a controlled "brain drain" from developing countries, as well as from the countries of the former USSR. Favorably using and often directly or indirectly inspiring economic and socio-political crises and conflicts in a number of countries and regions, the most developed countries, actively promoting their way of life, offering favorable working conditions (self-realization) primarily for the intellectual elite, were able to significantly enhance their own potential in this sphere, exhausting the intellectual component of the resources of competitors.

The main way to achieve geopolitical supremacy is expansion - expansion of the sphere of domination, carried out both by economic methods and non-economic [5] (armed seizure, diplomatic pressure, information-psychological warfare).

Traditionally, expansion in geopolitics was understood primarily territorial acquisitions and the establishment of military and political spheres of influence, as well as activities in this direction (expansion policy). Today, expansion is a continuous multilinear process aimed at a multitude of objects and, therefore, generating because of a conflict of interests a whole complex of diverse conflicts. The so-called "peaceful" expansion is carried out by many states and their groupings against each other at the same time, so we can talk about their "interpenetration" or, in other words, the formation of a complex of interdependencies and contradictions (for example, ensuring information superiority). Intra-coalition expansion is periodically accompanied by "voluntary" mutual concessions of the parties, although their overall balance is, of course, favored by the strongest of them. In the information society, an important aspect of geopolitical expansion is expansion in the information space (information expansion) [5].

Informational geopolitics in the fundamental aspect can be considered as a division of geopolitical science, studying the dependence (interrelation) of socio-political life (political events) from the "virtualized" aggregate living space, with the emergence of the global infosphere integrating information technologies, information and telecommunication systems and information resources, in addition to geographically determined and also spaces that have, in addition to the "territorial" (measured in one localized in the usual physical reality of geographical or spatial coordinates), "virtual" measurement - informational, economic, scientific, technical, socio-political, cultural and military.

The allocation of information geopolitics in an independent direction of geopolitical science is due to the fact that the information space in its development has reached that qualitative level that allows it to be viewed on an equal footing with traditional geographically determined geopolitical spaces as a kind of living space that influences the state and changes in socio-political life [9].

In an applied aspect, information geopolitics is an activity for the adoption and implementation of political (managerial) decisions, depending on the conditions that arise in the above-described integral "virtualized" spatial coordinates.

The goal of information geopolitics is to achieve, maintain, strengthen and expand power (influence) in these coordinates (spaces).

This goal is achieved mainly by solving the tasks of weakening ("eliminating" from the competition space) competing communities and gaining, retaining and expanding control over vital

resources integrated or wholly located in the information space.

Conclusion

To this end, a complex arsenal of forces and assets can be used, the basis of which is mainly "information" means and forms of influence on competing communities, such as information technologies, information weapons, various techniques and methods of information and psychological impact, information (information-psychological) expansion, information confrontation (information war). This arsenal is supplemented by various forms and means of ideological and cultural influence and the provision of economic, political, diplomatic and military pressure on competing communities, the application of which, in the case of realizing the tasks of information geopolitics, is subordinated to the concept of using the above-mentioned "information" component.

In general, the behavior of the subject of geopolitical relations in the implementation of information geopolitics for establishing dominance in the information space and full domination over competitors in the entire cumulative life space can consist of the following steps, gradually converting one into another as the intensity of relations with other subjects of geopolitical competition increases.

1. Hidden (informational) management of processes within the system of a competing community achieved by creating conditions that induce state power of a given subject of geopolitical competition to certain actions not so much in their own, as in other people's interests, carried out against the backdrop of information, ideological, cultural and economic expansion.

2. Information (information-psychological) aggression, reinforced by economic, political and diplomatic pressure (sanctions), the threat of military force.

3. Information war, accompanied by economic blockade, military-force actions.

The potential of the subject of geopolitical relations (competition) in the information sphere and other spheres of geopolitical competition interconnected with it is characterized by an integral indicator of information power (power).

The assessment of the state-entity of geopolitical competition in the information space is based on taking into account the level of development of the information infrastructure, the volume of flows of information accumulated and circulating in it, leadership in the development and implementation of high technologies (and information weapons), the degree of information dominance in relation to other subjects of geopolitical competition , which, in particular, can be expressed in the information (economic, political, cultural) dependence of national information ion infrastructure of these entities from the import of strategically important information and information technologies from the donor subject. Also at the present time, when the main battle for spheres of influence, which reaches the scale of the struggle for the redivision of the world, is conducted in the information space by special methods and means, the potential of the reflection of information aggression is included in the concept of the power (power) of the geopolitical subject.

Thus, a general assessment of the information power of a geopolitical subject in the information space can be made by evaluating the following positions [9]:

- Qualitative characteristics of the aggregate information potential of this entity, which includes information infrastructure, scientific and technical potential in the field of high technologies (primarily information), the general intellectual and spiritual potential of the society reflected in the information sphere, the forces and means of information confrontation, etc. ;

- the subject's possibilities for independent development in key areas of the formation of the national information infrastructure (the national information space) and scientific and technological progress in the field of information technologies and means of information confrontation, the preservation and strengthening of the intellectual and spiritual potential of society and the degree of its dependence on the achievements in this area of other countries;

- the possibility of information impact on this subject, its information space and related areas;

- The ability of this subject to sustainable development in the context of information confrontation and acute geopolitical competition in the information space;

- susceptibility to information transfer, hidden redistribution of the information resource of this subject by forces, means and methods of information impact.

As V.B. Veprintsev [3], the geopolitics of the information society can be a stage in the evolution of geopolitics as scientific and practical knowledge against the background of the transition from the energy age of the development of civilization to the information age.

This evolution is based on the natural need of the participants in the world geopolitical processes to ensure the sustainability of their own development. In the conditions of the limited natural physic-geographical coordinates of the existence of humankind on the planet Earth and natural (natural) planetary resources, the problems of providing the community with new vital spaces and resources are constantly arising.

In the newest historical period, human activity in such areas as information technology and space exploration has significantly expanded the many

spaces considered by geopolitical subjects as spheres of their vital interests, for the dominant positions and control over which a competitive struggle is conducted between different communities.

The geopolitics of the information society operates with various forms of space that form the cumulative environment for the existence of humankind at this stage of development. Such spaces include, for example, economic, socio-political, cultural, information and other spaces, the most characteristic feature of which for the era of building the information society can be considered their "virtualization" and mutual integration through the information space.

At the same time, the task of conquering and retaining control over the traditional "geographical" territories (regions) of the planet and the natural, technogenic (civilizational) and human resources that are necessary for the sustainable development of the state (human community), ensuring its interests and security, remains for geopolitics Information society is no less significant and relevant than similar tasks in "virtualized" spaces [10].

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SECTION 13. Geography. History. Oceanology. Meteorology.

WEDDING CEREMONY PARTICULARITIES AS PER RELIGIOUS TRADITIONS OF JEWS IN CENTRAL ASIA

Abstract: *Bokharan Jews are known to be the communal andethnolinguistic subpopulation of the Hebrew or Judaic Diaspora. Persons belonging to this nation have lived in Central Asia for centuries. Throughout its long history, Jews committed to smooth integration in the local community. Centuries of co-residence resulted in that the Jews resemble the locals in appearance; they speak local languages as natives, they adopted the culture and way of living. However, no one can state on entire assimilation: the Jews adhere to their religion, they only rarely mix with locals and yet, they still advocate their philosophy, incomparable with others.*

Key words: *Marriage, Torah, pre-nuptial agreement, marriage proposal, wedding rites, purification rite, secret meetings, dotal property, bride-price, rate for mother's milk.*

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Introduction

Currently, Judaism is one of 16 religious confessions, who are running their activities freely and peacefully in Uzbekistan and has its rich religious, national customs and traditions.

It is known that Jews hold their holidays and national ceremonies on the basis of laws and rules, established by the religion. Marriage based on nikah (religious rules based marriage), ensuring stability and happiness marriage is one the main wants of Jews. A number of ceremonies are hold ceremoniously due to establishment of a new Jewish family.

The pre-marriage ceremonies are matchmaking, seeing (meting) the bride, engagement, girl's (bride's) party, which are also held by almost all Central Asian nations. However, Bukhara Jews brought these ceremonies to the level of religious beliefs and these customs have been transferred from generation to generation.

Materials and Methods

According to the Jewish doctrine, nikah is an important prayer, which is considered to a great blessing from God to the Jewish people. According to Talmud: *"God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it"* or *"A man without a wife is destined to live without joy, pleasure in life, without Talmud, protection and peace*. According to the marriage contract, both young people lose their freedom, take over new duties and obligation from this day on [1].

In beliefs of the Jewish people, on the marriage day, the bridegroom is like a prince and the bride is like a princess and on this very day they both have Divine light and they become creators of their destiny. The ceremony of nikah is the day, when their previous sins are forgiven, and new forces/resources are accumulated for their new plan and they receive prayers of their kin people.

In ancient times, the age of marriage was establised 15-16 years for boys and 12-13 year for girls. During the Tsarist Russia colonial period, 14 years of age was strictly determined as the marriage maturity age for girls. However, most Jewish people would not adhere to this rule. Most Cneatral Asian Jew wuld engage their children form their earlychildhood and the childnren were considered to be "*гаровй бахши*" ("garavi bakhsi" (from Persion-Tajik – *guarantee of present/designation*)). Usually, in the final end, as a result of these verbal arrangments at the age of maturity, children would marry each other, but sometime, for certain reasons, verbal engangement may not end up woth a nikah. It is considered that breaking the "garavi bakhsi"

engagement would bring misfortunes and bad luck [5].

Usually, ancient Jewish people performed marriage ceremonies using the "*yenta*" process. Orthodox tradition communities still adhere to this custom. Today, many modren Jewish young people get married on love. Nevertheless, future bridegromm has to visit the girl's father and ask for blessing to marry his daughter and prepare a marriage contract and pay for the bride [3, 560].

Most central Asian Jews used to live in Bukhara and around it. Among Bukhara Jewish community, usually parents had to engage the young couple, look for a matching bride for the future groom, the "*khastgor*" process and arranging and holding the wedding. One of relatives of future groom visits the future bride's parents for matchmaking. Once the matchmakers agree with each other, the engagement ceremony takes place at the bride's house. This involves the future groom visiting the girl's father and asking for his blessing to marry his daughter. The following issues are mutually agreed during the engagement process:

-the amount of money to be given to the girls' father;

- fixing the wedding date not falling on the Shabbat or main Jewish holidays;

- Nikah/marriage contracts, in other words, agreement of terms and conditions ofktuba contract.

According to Talmud, marriage/nikah is a sacred tie and its strength depends on three actions:

1) husband dedicated part of his property to his wife to get her agreement/consent;

2) husband prepares "*ktuba*";

3) at mutual consent husband and wife enter marriage/nikah relationships. Purchase of marriage rings is considered symbolic meaning of this [7].

Jewish marriage weddings consist of two main parts: ширини хўри (shirini khuri - from Persian-Tajik – eating sweets/sweets things) and wedding itself. The but, if any relative of the bride or groom die unexpectedly, the wedding is postponed because of the funeral and mourning [5]. In addition, two more ceremonies are held during the wedding process: "*kidushin*" – getting clean/innocent [3, 560], the ceremony when the groom puts a ring on his wife's finger and declare her his wifeand "*khupa"* – the ceremony of groom taking the bride to his house [6, 185].

Relatives, neighbours and friends of the bride and groom and rabbis particpate at the engagement ceremonies. First, the groom's father sends sweats and nabat to the bride's house. The rabbi or very respected elderly people of the family distribute these sweets to the particiapnts of engagement and congratulate the girl's father. As a symbol of engagement, some remaining part of the sweets is ditributed to the acqiaintants, who cannot partiicpate at engagement.

After the engagement, the pre-wedding ceremony is held on a fixed day of the week. In this way, on a Wednesday or Thursday the ceremony of "*qudobin*" (or*qudobinon (*from Persion-Tajink – seeing/meting of –in law parents). The groom's family sends sweets and presents to the house of bride. At this ceremony the men and women gather in one room, and the community are shown the presents, sent by the groom's side.. After qudobinon they hold the ceremony of "*ro'binon (*from Persion-Tajik – seeing the face)". Often, this ceremony is held on hte same day as the audobinon. On ro'binon, the groom gets acquainted with the relatives of the bride and meets (dates) the bride for the first time. Relatives of the groom are the first to see the girl/bride. Then қhe is left aloneand the groom brings some food on a place and some wine in a glass and hands it over to her.

After the first meeting/dating until the wedding, the groom often visits the bride's house, even, sometimes, he can stay at the bride's house and have meetings/dates with the bride secretly. The secret meetings are called "bakhida boz" (play with the presented/designated). After qudobinon, preparations, and collecting, purchasing of clothing is started.

According to Jewish tradiitons, one week before the wedding the bride and groom should be holding certain ceremonies without seeing each other:

- The groom announces the wedding in the synagogue in the ceremony called "ufruf" and after prayers, he invites all his co-believers to the feast;
- The bride should perfrom a special getting cleaned/innocent ceremony called ""*mique*";
- At Jewish weddings men wear *yarmulkes*, while women wear ordinary white dresses, and the bride wear her bridal veil [8].

Orthodox Jewish call the engagement ceremony as "*Kabalat-panim.*" At the feast ceremony, they organise a separate feast for the bride and groom. The bride's side arranges feast for their kin and relatives and sit at a special place. While the groom also sits at the high place of a tablecloth usually, preparation of the marriage contract is finalised on this day and people read/pray *Talmud* verses [3].

On Friday before the wedding, tehy arrange a ceremony at the bride's house called "takhzanon" (from Persion-Tajik – setting of clothing in folds), where they demonstrate the cloting/dresses of the bride. *Kayvon* solemnly shows all the clothing and other things to the attendants. On Saturday evening, they arrange "*shabi dukhtaron*" – girls' party, sometimes the groom and his frioends also attend this party.

After the grils' party, on Sunday they arrange "*hammombaron*", i.e., taking the bride to the banya (washhouse) and after that they perform the ceremony of "*qoshchinon*", i.e., they clip the bride's eyebrows fro the first time and another feast tabloth

is spread. The groom pay all costs of this ceremony himself.

The special cleaning/getting innocent/decent ceremony called "*miqve*" is carried out in the following way: in presence of all women, the girl takes off all her jewelleries and while groom prays, the bride washes herself. The groom bears the costs of this ceremony as well [7].

Bukhara Jews also have a ceremony of "*hinabandon*" i.e., painting/putting henna extract on the brides' hands, which is held at the bride's house and another festive tablecloth is spread. Only women take part at this ceremony. On Tuesday, they sign the "*ktuba*" marriage contract. The contract is written in Yiddish, the clothing and associated things collection "chezi" and its value is written in their mother tongue. The amount of bride money is also agreed.

The cloting and associated thing of the bride include wmoen's clothies, matrasses and cushions, golden and silver jewellery. The minimum amount of such colection is called "*setvi*" and it contains 15 each of dresses, women's pants and kerchiefs, matrasses and cushions [5].

The Jewish bride's side family should prepare everything for happy life of the young couple, including preparation and furnishing accommodation for living, while the groom's side should prepare respective household gear [9].

On Wednesday, they hold the *ceremony of kidush* at the bride's house. This ceremony is also performed with enormous feast, singing and dancing and many guests [5]. Generally, one can see combination mix of many nations in pre-wedding and nikah wedding ceremonies of Jewish people. Once can hear music and songs and watch dances of Uzbek, Tajik, Iranian, Arab, Turkish, Spanish and Caucasian people [2].

At the wedding, the bride's head should be covered with something. Because the Rabbis legal status bans them reciting prays to God and prayers in presence of married ladies with uncovered heads because the women with open (uncovered) head are considered naked. Until 19th century in Europe, before the secular culture was introduced to their life, used walk with covered heads. The situation has changed by now [10].

For cleaning themselves both physically and mentally, the groom and bride take fasting on the wedding day like Yom Kipur. Nikah (religious marriage ceremony) is performed attended by only close relatives under a baldachin to protect them from eyeing. The visitors must not have any locks or tied thread in their hands. One of the women enters the "chimildiq" (large piece of cloth hung in the corner) and sew the clothes of both the bride and groom together. The nikah ceremony ends by the groom putting a ring on his wife's finger and he Rabbi reciting the Nikah prayer [5, 255-256].

After completion of nikah ceremony, the Bukhara Jewish groom takes the bride to his house. In ancient time they used to take the bride on horse packs. Nowadays, they take her on latest produce luxury cars. After arrival to the groom's house, the groom meets her with a mirror and then this mirror is taken around the feet for three times. This practice is a symbol of wish that the happiness of the new family be clean and transparent like this mirror. Then the ceremony of "*shabi zanon*" starts at the groom's house. He gives gifts to the bride and her relatives and takes her to his room. This room of pleasure is called "dari hujra." The wedding festivities end with joy and singing and dancing. Next morning the ride's mother, after they receive the news that she proved to be virgin, she sends bread and nisholda (sweet jelly eating made from sugar and eggs). On Sunday, the bride's girlfriends visit her for the "choykunon" (cup of tea) ceremony to have tea together. And on Monday, they arrange the last "*shabi javonon*" ceremony. On day eight after the Nikah, all ceremonies end and the bride starts her life as a housewife and proceeds with household works [5, 256].

Bukhara Jews like eating lamb food and chicken and they treat the guest with such food [5, 255-256].

Jewish ceremonies are modified as the times past. Central Asian Jews have special customs called "*brides money*" and "*money for mother's milk*". In addition, grooms taking the bride for a three rounds around the fire or dancing of grooms relatives and friends around the fire are signs of pyrolatry that had existed in the territory of Central Asia. Nowadays, on a wedding day, visiting various (worshipping) places, driving around/seeing various sightseeing sites of cities together, taking photos for future memories are now some of the newly/recently introduced customs and traditions and most young people practice such [4].

Conclusion

The same very tradition has become customary for all brides and grooms in most cities and town of Uzbekistan irrespective of their nationality. In addition, it is a widespread custom among Uzbeks to prepare complete sets of clothing for bride and groom, numerous morasses and cushions, carpets, crockery-dishes and other things and utensils that are required for a new family. The tradition of giving bride money and "token for mother's milk" to bride's father is still kept to in all regions of Uzbekistan among Uzbeks.

The following can be said in conclusion:

- From ancient days, Central Asian Jewish people had always been part of the society of the region, and took a specific position in its social and economic life;
- They fully adhere to the holy book of Judaism Talmud and other sources;

- Jewish people raised creating a family to worshipping level;
- The Jewish people of the region perform Nikah/marriage ceremonies by strictly adhering to the orders and rules and traditions that had been preserved from ancient times;
- Each ceremony and ritual has its name, they are mainly expressed in Tajik words and phrases. For instance, qudobinon, ro'binon, shabi zanon, shabi javonon and others (кудабинон, рӯбинон, шаби занон, шаби чавонон);
- Central Asian Jews had been living together with the local population in friendship, peace and cooperation, took and mutually enriched/modified some features of customs and traditions of the people of this region;
- Preservation and mutual enrichment of the Jewish people customs and traditions until now is reflection of true religious tolerance in the region for centuries.

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SECTION 31. Economic research, finance, innovation, risk management.

FOREIGN EXPERIENCE OF DEVELOPMENT OF TEXTILE INDUSTRY

Abstract: *This article describes the foreign experience of the development of the textile industry in Bangladesh, Japan and Turkey. The characteristics of the production of men's and women's clothing in these countries are presented. The specifics of the development of the textile industry have been described. At the end of the article, have been discussed development trend of textile branch in Uzbekistan.*

Key words: *textile industry, cotton fabric, fiber, Bangladesh, Turkey, Japan, development.*

Language: *English*

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Introduction

The textile industry is divided into cotton, woolen, silk, linen, hemp-jute industry, production of non-woven materials, cotton manufacture, etc., for spinning, weaving and finishing production. The location of enterprises for the primary processing of raw materials is dispersed and tends to the places of its production. Until the beginning of the 18th century, the rather labor-intensive textile industry developed mainly in handicraft ways in workshops and at home. For a long time, the densely populated regions of Eastern countries (Persia, China, Egypt) were the leaders in the production of natural fabrics and products from them. Textile goods from these countries have long been an important subject of export to Europe.

The textile industry as a whole is developing at a faster pace in the group of developing countries. Today, the world's textile industry has five main regions: East Asia, South Asia, CIS, Overseas Europe and the United States. The main region of the textile industry in the world has become Asia, which today accounts for about 70% of the total number of fabrics, more than half of the production of cotton and woolen fabrics. The main producers of cotton fabrics are China (30% of world production), India (10%), USA, Russia, Brazil, Italy, Japan, Taiwan, Germany, France. The leading producers of wool and woolen fabrics are Australia, New Zealand and China. Developed countries of the world (especially the USA, Italy, Japan, Germany, France), while reducing their share in the production of cotton and woolen fabrics, remain the largest producers of knitwear, fabrics of chemical fibers (synthetic and blended). Although in these types of textile industry their role is steadily falling due to the organization of production in developing countries (India, China, Republic of Korea, Taiwan, etc.).

Literature review

Scientifically-theoretical aspects of the study of the competitiveness of light industry enterprises are the research direction of many foreign scientists. The works of Mboya J, Cline W, Doeringer P, Crean, S. Dickerson K. G, Nordas H. K., Verma S, Xiajun.A, Juyoung Lee, Dorothee H., Mayukh D. have become classic works. Although the aforementioned researchers have made a significant contribution to the field of economics, they do not take into account the peculiarities of choosing appropriate marketing strategies for enterprise competitiveness, as well as the use of innovative marketing strategies. In the countries of the CIS, scientists such as E. Evgenivech, A.Statsura, Yu.Filyukov, I.Prazyan, T.Fradina, S.Genova conducted researches. The scientific findings of these scientists provide scientific recommendations on the use of various methods of assessing the competitiveness of light industry enterprises and the application of marketing strategies. The systematic analyzes of raising competitiveness based on marketing strategies and the identification of strategies to protect the domestic market have not been sufficiently studied. General aspects of increasing the competitiveness of

industrial enterprises in Uzbekistan by marketing strategies I. Iskandarov, S.G.Gulomov, B.Yu.Khodiev, Y.A.Abdullayev, A.Soliev, M.Kosimova, A. Sh.Bekmurodov, M. R.Boltabayev, Z.D.Adilova and others.[1-14] Foreign experiences of textile and problems of competitiveness founded by Uzbek researchers as Z.Hakimov, B.O.Tursunov and others.[15-17].

About the production of ready-made garments in Bangladesh

The production of ready-made garments acts as a catalyst for the development of Bangladesh. The tag "Made in Bangladesh" brought fame to the country and became a prestigious brand around the world. Bangladesh, which, according to cynics, was considered a "bottomless basket", has now become a "basket full of miracles." The country, with its limited resources, supports 6% of the average annual GDP growth rate and follows the path of significant social and human development. After gaining independence in 1971, Bangladesh was one of the poorest countries in the world. None of the industries in Bangladesh developed when it was part of East Pakistan because of the discriminatory attitudes and policies of the then West Pakistan government. Thus, the restoration of a war-torn country with limited resources became the biggest problem. The industry that makes a decisive contribution to the reconstruction of the country and its economy is the ready-to-wear industry (RMG from Readymade Garments). Currently, RMG is the largest export income for Bangladesh. This industry accounts for 81% of the country's total export earnings. At a time when the largest export earnings from jute declined, the ready-to-wear industry changed and even bypassed the profitability of the jute industry. The garment industry of Bangladesh began its journey in the 1980s and reached the heights at which it now stands. The late Nurul Kuader Khan was a pioneer of the ready-to-wear industry in Bangladesh. He had an idea of how to revive the country. In 1978, 130 trainees went to South Korea, where they learned to produce ready-made clothes. Together with these trainees, he created the first plant "DESHGarments" for the production of clothing for export. At the same time, the late Akhter Mohammad Musa of BondGarments, the late Mohammed Reasuddiniz "Reaz Garments", MdHumayun of "ParisGarments", engineer Mohammad Fazlul Azimiz "Azim Group", major Abdul Mannaniz "SunmanGroup", Shamsur Rahman from"Stylecraft Limited, the first president of B.G.MEA, A.M.Subid Ali of Aristocrat Limited, stepped forward and created some of the first garment factories in Bangladesh. The garment industry of Bangladesh began its journey in the 1980s and reached the heights at which it now stands. The late Nurul Kuader Khan was a pioneer of the ready-to-wear industry in Bangladesh. He had an idea of how to revive the country. In 1978, 130 trainees went to South Korea, where they learned to produce ready-made clothes. Following their example, other prudent and hardworking entrepreneurs began to build RMG factories in the country. Since then, the Bangladeshi garment industry has not had to look back. Despite the numerous difficulties faced by the industry in recent years, it preserves its place in the world market and continues to show reliable performance. Now the garment industry is the largest export sector of Bangladesh with the cost of export revenues of more than $ 25.49 billion dollars in the fiscal year 2014-15. On its way to success, the ready-to-wear industry has faced a number of problems. The biggest problem for our garment industry was the tragic collapse of the building in 2013. Many thought that the collapse of the building would mean the end of the way for the ready-made garment industry. But, despite the prejudice, we saw a new beginning of the ready-to-wear industry. For the first time in the history of the world's clothing industry, all stakeholders have realized that ensuring the safety and well-being of workers is a shared responsibility. This incident has inspired the government, brands, buyers, suppliers, entrepreneurs and workers to work hand in hand to provide a safe and sustainable garment industry. Probably, this is the only example in the business world, when sellers and buyers have teamed up to make the industry safe and sustainable.

The industry that has changed the lives of millions of people has gone through significant changes in terms of labor safety and workers' rights. National and international reform platforms - the National Action Plan (NAP), the Accord and the Alliance, have made significant progress in securing workplace safety. Both Accord and Alliance controlled 100% of the factories, ANAP completed the inspection of 100% of the factory until August. It's nice to note that less than 2% of the inspected factories were found to be vulnerable and closed immediately. In addition, to make progress more transparent and trustworthy, plant inspection reports are available in the Fair Factory Clearing house (FFC) database and on all websites of the government department, Accord and the Alliance. When all factories go through corrective action plans (CAPs), the textile industry of Bangladesh can obviously be considered the safest industry in the world.

Progress was also made in securing the rights of workers. Over the past 5 years, the minimum wage for textile workers has been increased by 219%. Significant improvements have been made to the labor law to ensure the rights and welfare of workers. B.G.MEA together with ILO and ITC implement training programs for employee-management, labor and health protection, as well as labor laws for both managers and employees of the factory. The industry

achieves great success in terms of compliance with environmental requirements and has a stable support in the general clothing market.

Table 1

The main textile goods exported from Bangladesh in million US dollars.

Years	Shirts	Trousers	Outerwear	T-shirts	Sweaters
2000-2001	1073.59	656.33	573.74	597.42	476.87
2002-2003	1019.87	643.66	464.51	642.62	578.37
2004-2005	1053.34	1667.72	430.28	1349.71	893.12
2006-2007	943.44	2201.32	1005.06	2208.9	1248.09
2008-2009	1000.16	3007.29	1299.74	3065.86	1858.62
2010-2011	1566.42	4164.16	1887.50	4696.57	2488.19
2011-2012	1733.54	4686.39	2231.16	4713.11	2340.34
2012-2013	1972.89	5185.48	2634.28	5143.22	2620.73
2013-2014	2173.73	5690.78	2973.16	5863.81	2932.94
2014-2015	2271.43	5697.83	3183.17	6064.13	2829.16

Source: Complied by the author based on statistics at URL: http://www.bdembassyusa.org/uploads/Apparel.

Many textile factories themselves introduce environmentally friendly technologies and practices. They use cleaner technologies and produce clothing in a careful and responsible manner to preserve the environment for future generations. Already several RMG factories have received a LEED certificate from the US Green Building Council (USGBC) for their friendly with nature methods.Strength of industry:

- 30 years of experience and reputation in the production of clothing;
- Competitive price;
- International Quality Standard;
- Young people, 70% below 40, fast learner and responsible in their work;
- Unshakable and persistent entrepreneurial spirit;
- Access to the duty-free market in most developed countries & OTA in India, China, Korea, Malaysia;
- Rapid adoption of friendly with nature, energy-efficient and green concepts;
- Rapidly developing binding industries / laundry / paint / finishing / embroidery, etc. ;
- Universality of plants for production of various types of products;
- The trend towards the growth of direct sources at the local level through liaison offices in Dhaka;
- Basic textiles.

The boom in the ready-made garment industry made Bangladesh one of the leading clothing exporters in the world. During the last five consecutive tax years, the income from the export of knitted garments amounted to 7.2% of the national GDP on average, demonstrating that this sector of the economy is strategic and commercially profitable for the country.

This sector contributes about 13 percent of GDP, when in 1991 this figure was only about 3 percent. About 50 percent of the 4 million people employed in this sector are women from rural areas. In 2000, an industry with around 3,000 plants employed more than 1.5 million workers, directly 80% of whom were women. The USA is the largest importer of Bangladesh clothing products, as well as Germany, Great Britain, France and other EU countries.[22]

Textile industry in Turkey

The textile industry is one of the oldest and leading sectors of the Turkish economy. Economic reform, carried out in 1980, contributed to the growth of exports of textile products and the import of new textile equipment. In 2002, the textile industry produced goods at $ 16.6 billion (in 1990 - $ 8.8 billion) and exported $ 6.2 billion (in 1990 - $ 3.1 billion). In 2005, textile production was $ 17.5 billion, in 2006, textile exports reached $ 8.1 billion (including fabrics - 3.1 billion, fibers and yarns - more than 1.7 billion). In 2009, the top ten buyers of Turkish textiles included Russia (15%), Italy (9.7%), Germany (6.1%), Romania (4.6%), Poland (4.3%), Iran (4.1%), Bulgaria (3.8%), Great Britain (3.2%), Egypt (2.9%) and the United States (2.9%). The main articles of textile exports are synthetic fabrics, cotton fabrics, yarn and yarn, woolen fabrics. In addition, Turkey is the world's leading producer of wool yarn and the third largest producer of mohair. Over the past twenty years, Turkey's share in the supply of light industry products to the world markets has grown tens of times, bringing the country to the fourth place in the world. Currently, more than

35,000 medium and small companies are represented in Turkey. The share of exports of ready-made garments and textiles in the total volume of exported by the state is 40% and accounts for about 10% of Turkey's total GDP.

In the textile, clothing and leather industries of Turkey, more than a third of all workers in the manufacturing industry are employed (according to various data, from 750,000 to 1.9 million people and about 40,000 companies worked in the textile and clothing industries).

The share of private foreign and Turkish state capital in the light industry is negligible. Under the pressure of cheaper products from China, Vietnam, India, Bangladesh and Pakistan, many Turkish companies have moved to a more expensive price segment and mastered the production of branded products.The Turkish textile and clothing industry produced products: in 1979 - by $ 595 million; in 1990 - by 5.1 billion dollars;in 2002 - by 27.7 billion dollars (exported by 13.9 billion dollars), its share in the total industrial production was 21.5%, in the total export of industrial products - 36.2%, in total exports - 33 , 7% and in Turkey's GDP - more than 10%; in 2007 - by $ 30 billion, exports of textiles, clothing and carpets reached $ 24 billion, accounting for 21% of total exports (Turkey moved to the fifth to sixth place in the world for the export of clothing and the third or fourth place - for exports home textiles); in 2009, exports of textiles and clothing fell to 19.3 billion dollars, accounting for 19% of total exports.If in the 1980s, fiber, yarn and cloth predominated in exports, then the proportion of finished clothing gradually increased. The main importers of Turkish textiles and clothing are the EU countries, Russia and Ukraine. In 2005, Turkey produced 1.65 billion m of cotton fabrics (in 2004 - 1.7 billion m), 688 million m of synthetic fabrics, 63 million m of woolen fabrics, 13 million m of linen, hemp and jute fabrics and 55,000 tons crocheted fabrics, as well as 1.05 million tons of cotton yarn, 714,000 tons of artificial yarn, 453,000 tons of chemical fibers, 200,000 tons of wool yarn, 2,000 tons of linen and jute yarn, and 1,000 tons of mohair.

Turkey is a major producer and exporter of home textiles, especially to the EU countries (where it ranks second in this sector). In 2007, the country exported home textile products by $ 1.9 billion (towels, bed and table linens, curtains, curtains, bedspreads, upholstery and blankets).

The carpet industry continues to play a big role. In 2007, the country exported machine-made carpets for 850 million dollars (capacities allowed to produce more than 190 billion square meters) and carpets and handmade rugs for $ 186 million (production estimated at 3.5 million m²). [21]

With the increase in the well-being of citizens, the demand for technical textiles and articles of non-woven materials - feminine hygiene products, diapers, medical textiles, dental floss, tuppers, etc. - has increased. In addition, technical textiles are widely used in the automotive, packaging, clothing and chemical industries, construction, logistics, medicine, filtration and agriculture (bags and large bags, cord tires for tires, seat belts, membranes, covers, high-strength fabrics, ropes and ropes). In 2007, Turkey produced 110 thousand metric tons of non-woven textiles and exported technical and non-woven textiles for more than $ 1.5 billion (the country ranks first in the world for the export of large bags and bags and one of the leading destinations for the export of cord fibers for tires). [20]

History of Industry in Japan

In the second half of the nineteenth century, in Japan, the textile industry was rapidly developing, and at the same time heavy industry was growing, which was to a large extent contributed to the state. Unlike America, where free competition became the medium of business relations, in Japan, economic freedom was not the main value, but paternalism, patronage from the state. At the end of the XIX century, the state actively organized state funds for the enterprise and sold them to private hands. For example, the largest Japanese shipbuilding plant in Nagasaki was sold to Mitsubishi, and later it also received gold mines on Sado Island (near Honshu, near Niigata City), Ikuno Silver Mines (northwest of Kobe)), Hokkaido coal mines. Trading house "Mitsui" received textile factories and coal mines Miike (in the west of the island of Kyushu, in the prefecture of Kumamoto), etc. The manufacturing industry, whose accelerated development on a modern technical basis began in Japan immediately after the Second World War, without exaggeration, was "a locomotive Economic development of this country. It was thanks to her that for the first time in the world truly phenomenal results were obtained - the average annual growth rate of Japanese industry in the period 1955-1973. exceeded 10%. Gradually, the structure of Japanese industry was supplemented by increasingly complex and modern industries, primarily machine-building, export-oriented.[19]

According to statistics compiled by the Japan Textile Machinery Association, the nation’s production of textile machinery in 2017 sharply increased by 17.6% over the previous year to 235,049 million yen. Exports also grew by 19.4% to 256,024 million yen, indicating vigorous capital investments worldwide. Production increased for nearly all categories except for looms, and exports also rose except for looms and parts. In addition to vigorous capital investments thank to a favorable global economy, production was supported by capital investment support measures from the Japanese government, such as subsidies and a preferential tax system. [24]

Strategy of development of the textile industry of Uzbekistan

The projects implemented in the light industry contribute to the equipping of enterprises with modern technology and technologies, further increasing the volume of production of finished consumer products. High-quality goods of light and textile industry of Uzbekistan are also supplied abroad. If in 1991 the volume of processing of cotton fiber in Uzbekistan did not exceed 7 percent, in 2016 this figure reached 40 percent. Today, the textile industry exports textile products to more than 50 countries. In recent years, exports to Brazil, Chile, Croatia, Nigeria and other countries have been established. The Decree of the President of the Republic of Uzbekistan Shavkat Mirziyoyev "On the Program of Measures for the Further Development of the Textile and Sewing and Knitting Industries for 2017-2019" of December 21, 2016 opened new opportunities for improving the industry. The program provides for the transition to 2020 to complete processing of cotton fiber harvested in our country, an increase in the production of industrial products by more than 2.7 times, and delivery of products to the domestic and foreign markets. [23] This will create a competitive image of the domestic light industry and confidently enter the world's trading floors. Analysis shows that today yarn accounts for almost 50 percent of exports. The priority task is to increase the export of products with high added value due to a gradual decline in the export of yarn. Currently, the share of finished products in the total production is 47 percent, in the future it is planned to increase this figure to 65.5 percent, to increase the share of finished goods in the structure of exports from 41 to 70 percent. Within the framework of the program in the period 2017-2020, the industry will attract more than 2.2 billion dollars of investment, almost half - foreign. Investment projects will allow creating special textile complexes operating on the basis of a four-stage system, including all processes from processing to manufacturing finished products, as well as more than 27,000 new jobs. It is also planned to organize 120 new ones and modernize more than 10 enterprises. The following areas were selected for placement of production capacities for sewing and sewing and knitting production: Sariasiy, Sherabad districts of Surkhandarya region, Gulistan, Sayhunabad districts of Syrdarya, Gallyaaral, Jizzakh districts of Jizzakh, Yakkabag, Shakhrisabz districts of Kashkadarya, Uchkurgan, Papsky districts of Namangan, Akdarya, Urgut districts Samarkand region, Khodjeyli, Chimbay districts of the Republic of Karakalpakstan. The projects stipulate that cotton fiber will be completely processed where it is harvested, there will also be products with high added value. All this will lead to an increase in real incomes of the population of these regions. The allocation of loans for projects will be implemented on the basis of a completely new mechanism. Commercial banks will co-finance projects and open credit lines for the acquisition of modern spinning, weaving and painting equipment. In projects implemented through commercial banks attracted funds, banks or their investment companies can participate with a share of up to 100 percent in the authorized capital of the enterprise. Banks are given the right to exercise capitalization of interest accrued in the investment period for granted loans and not to apply the established limitations on equity participation in the authorized capitals of enterprises.

One of the key features of the program is the development and implementation of new industry standards for the design and construction of textile enterprises based on foreign experience. These standards will ensure a reduction in construction and installation costs and the predominant use of local building materials. The term of tax and customs privileges granted to stimulate the processing of raw cotton has been extended until January 1, 2020. [23] The list of benefits is supplemented by exemption from the payment of profit tax and property tax, a single tax payment for microfirms and small enterprises, payment of mandatory contributions to the Republican Road Fund, exemption from property tax on textile enterprises exporting up to 40 percent of their output, exemption from customs payments (except for fees for customs clearance) for imported equipment, components, non-produced in our country, raw materials used for production non-food consumer goods according to the lists approved by the Cabinet of Ministers of the Republic of Uzbekistan. It should be noted that, in accordance with the invitation of the Korean Institute of Industrial Technology (KITECH), a delegation of the Republic of Uzbekistan consisting of representatives of JSC Uzbekengilsanoat, the Ministry of Higher and Secondary Special Education and the Tashkent Institute of Textile and Light Industry was in the Republic from 12 to 19 December Korea to discuss the implementation of the project to create a Textile Technopark in the city of Tashkent.

Conclusion

Textile – is one of the oldest type of production. Nowadays, in Uzbekistan have been doing wide work in developing of textile branch. According to the calculations, by 2020 cotton yarn will be completely processed at domestic enterprises. As a result, there will be a significant reduction in exports of textile semi-finished products and an increase in exports of finished goods by 2.1 times. The present prosperous life in our country confirms the correctness of our chosen path of development. The population's need for affordable, high-quality and modern clothing is provided. The ongoing work on deep processing of cotton fiber on the basis of

modern technologies, the establishment of ready-made consumer goods in the regions will help to provide the domestic market with in-demand production of own production.

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SECTION 20. Medicine.

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USE OF LOCKING PLATES IN DISTAL TIBIAL FRACTURE

Abstract: *Background information: In open factures or where soft tissue is damage in distal tibia the use of Traditional external fixation method is a common treatment. It is used as a temporary or an absolute treatment. But this method has some disadvantages as its huge size and it passes over the joint. Due to these reasons use of locking plates is more suitable.*

Methods & setting: This study was done on 20 patients who presented in Bahawal Victoria Hospital Bahawalpur with fractures of distal tibia involving metaphyseal plate. Duration of study was from January 2016 to June 2017. Locking plates were used in these cases as an external fixation contrary to traditionally used external fixation methods. Follow up of these patients was done for recording time taken for union of bones and complications were observed such as non union of fracture, malunion and surgical site infections.

Results: All cases operated showed no complication of malunion, infection of plate etc. The average time for healing of fracture was 15 weeks with the range of 10-20 weeks. Plate was removed after 4 weeks of full weight bearing walk on the affected limb. The HSS score (hospital for special surgery score) was calculated. That was from 70 to 100 with mean score of 75 on first follow up (after 4 weeks), and from 80 to 100 with men score of 86 on last follow up (after 18 months). Another scoring system used was AOFAS (American orthopedic foot and ankle society) score. This score was from 88 to 100 with mean score of 90 and from 91 to 100 with mean score of 93 after 4 weeks and 18 months respectively.

Conclusion: In open type fractures of distal tibia use of locking plates is ideal due to its lighter weight than traditional external fixators and it has less complication. As this does not passes over the joint so allows early mobility in the patient and provides good range of motion at the joint.

Key words: *open tibial fractures, external fixation, locking plates*

Language: *English*

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INTRODUCTION

Trauma of limbs is very common these days due to road side accidents and much common complication is fractures of limbs. Many patients report in emergency department with open fractures of distal tibia. As internal ixation has many complications so external fixation is done.[1-3] Traditional technique of external fixation was used in these patients.[4,5] It has some discredits that's why a new technique of external fixation by locking plates is used as a temporary or absolute treatment.[6-11] In external fixation method soft tissue gets less damage. In the use of Locking plate early mobilization can be achieved with minimum post operative complications such as mal-union, non-union and deep tissue infections etc. Joint mobility can be achieved as it does not involve joint as compared to traditional fixators. This method is more safe and acceptable by the patient. Joint stiffness can be avoided. It allows rapid healing of bone and keeps fragments of bones aligned.

PATIENTS AND METHODS

This study was done on 20 patients admitted in orthopedic department of Bahawal Victoria Hospital Bahawalpur from January 2016 to June 2017. These patients had open fracture of distal tibia. In these cases locking plates were used as external fixators.

Out of 20 cases 15 were males and 5 were females with age range from 28 to 70 years and mean age of 45 years. Among these 20 study objects 2 got trauma due to fall from height and remaining 18 from roadside accidents. Open fracture was present in 14 cases and closed fracture was in 6 cases. X-ray of fracture site was done in each patient before and after operation. They were also examined on each follow up for any complication and also HSS and AOFAS scores were calculated. Operation was done under general anesthesia. Affected limb was paint and drabbed. Fracture site of tibia was reduced with either open or closed method. After reduction external plates were applied and locked with 4 to 5 screws on both ends of plate by giving small incisions on the skin. Fluoroscopy was used to check the position of implant. Patient was started to mobilize after 3 days of operation with little weight bearing in the operated limb and gradually patient was allowed to achieve full range of motion. When patient started to walk on affected limb with complete weight bearing for 6 weeks then plates were removed.

Table-1

Data of patients with type of fracture according to Gustilo classification.

Number of Case	Gender	Age (years)	Involvement of Soft tissue
1	F	35	Gustilo-1
2	M	26	Gustilo-2
3	M	60	Gustilo-1
4	F	65	Closed
5	M	28	Gustilo-3a
6	M	44	Closed
7	M	51	Closed
8	M	36	Closed
9	F	38	Gustilo-2
10	M	46	Closed
11	M	70	Gustilo-2
12	F	49	Gustilo-1
13	M	33	Gustilo-1
14	M	29	Gustilo-1
15	F	25	Gustilo-3a
16	M	37	Gustilo-3a
17	F	64	Gustilo-1
18	M	58	Gustilo-2
19	M	41	Gustilo-1
20	M	48	Gustilo-1

RESULTS

This study was done on 20 patients reported with fracture of distal tibia. Among them 5 (25%) were closed fractures and 15(75%) were open type of fractures. Open fractures were classified by Gustilo classification. Out of 15 open fractures 8(53.3%) were of Gustilo-1, 4(26.7%) cases were Gustilo-2 and 3(20%) cases had Gustilo-3A fracture. (HSS) Hospital for special surgery score range was 70-100 with mean score of 75. Score range of (AOFAS) American orthopedic foot and ankle society was 88-100 with mean score of 90. Age of patients was from 18 to 35 years with mean age of 24 years.

Picture 1 - Different types of distal tibial fractures and their frequencies.

DISCUSSION

This study was done to find advantages of locking plates in distal tibial fractures as compared to other traditionally used external fixators. Only those patients were included in the study which got open or closed fractures of distal tibia. Internal fixators have many disadvantages as more chances of infection and more tissue damage. While external fixation technique is safer and less tissue damage occurs.It is indicated in severe open fractures, contaminated wound, bone loss from fracture site, fractures got in war, burn wounds on fracture site etc. Traditional external fixators traverse the joint and limit its mobility and are relatively bulky. In this method there are more chances of nonunion, malunion, joint stiffness and deep infections. Before use of external fixation locking plate were considered for internal fixation.[12] During the decade of 80s few doctors used locking plates as external fixator.[13] So it was found much attractive method due to less tissue damage, light weight frame, good stability and easy to apply and easy to remove. After that much advancement was done in this field to make it better. According to a study done by Kloen et al he used compression type of plates for external fixation. He used long compression plate temporary or as absolute treatment for infected fractures. He found this method economical and acceptable by the patients.[9,10] Another study done by Ma et al. He treated open fractures in two steps. First he applied locking plate as external fixator. When debridement of wound and coverage by soft tissue done, then he applied internal fixation by locking plates. Its results were much good. There were less complications and good stability of bone. According to our study distal tibial fractures were treated with locking plates of anatomical type as external fixator. This allowed good range of motion at the joint, early mobility and less chance of infection. Patient was able to put partial weight on the affected limb within just first week. Patients were called for follow up after 4 weeks, 2 months, 4 months and after 6, 6 months. X-rays were done on each visit. HSS score was calculated as 70-100 with average value of 75. AOFAS score was 91-100 with average value of 93. Final visit was done after 18 months of operation. Most of the patients underwent removal of plate after 5-6 months after walking on the affected limb for 4-6 weeks with bearing full weight. Infection of implants is very common after surgery as studied by Dillin and Slabaugh.[15] They done open reduction and internal fixation in 11 cases and among them 55% cases got surgical site infection.

CONCLUSION

Use of locking plate as an external fixator in the treatment of distal tibia fractures is better than use of traditional bulky external fixators which cause more tissue damage and more complications such as nonunion, malunion and deep infections. Externally used locking plates have much less complications and good stability of bone. This is light weight relatively and easy to apply and easy to remove.

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IMPLEMENTATION OF THE NATIONAL TARGETS OF BULGARIA RELATED TO "EUROPE 2020" STRATEGY AND THE DEVELOPMENT OF KNOWLEDGE-BASED ECONOMY

Abstract: *The present study focuses on the implementation of the targets of "Europe 2020" strategy in Bulgaria such as the share of early school leavers, the share of 30-34 year-olds with tertiary education and the share of all individuals with tertiary education, R&D investments, the level of employment and reducing the number of people at risk of poverty or social exclusion and covers the period 2010 – 2016. The study includes results and conclusions from research part of a dissertation related to the problems of reproduction of human capital and the future development of a knowledge-based economy in Bulgaria. The aim of the study is to analyze the progress of the implementation for 4 of the targets of the National Reforms Program in Bulgaria according to "Europe 2020" strategy which correspond to the requirements of the knowledge-based economy such as education, R&D, employment and reducing the poverty levels so that more people can gain access to knowledge, adequate healthcare and culture and by that to enhance the labour productivity and the competitiveness of the economy.*

Key words: *knowledge, knowledge-based, economy, education, R&D, employment, poverty, Bulgaria, EU*

Language: *English*

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Introduction

Growing competition, demographic problems, scarcity of resources and global focus on development of knowledge-based economies in the first and the second decade of the 21st century required the European Union to take on a new path of development outlined in "Europe 2020" strategy. It was adopted after the global financial crisis of 2008 and aimed at addressing economic and social weaknesses in each member state and promoting the important roles of education and knowledge for economic growth. The implementation of the main priorities in this ten-year strategy, according to its authors, was expected to create conditions for smart, sustainable and inclusive growth in each member state and in the European Union as a whole. Bulgaria as one of the 28 member state countries of the EU has developed its National Reform Program (updated in 2017), which corresponds to the "Europe 2020" criteria, but sets realistic levels of implementation of these criteria for the country.

The present study focuses on the implementation of the targets of "Europe 2020" strategy such as the share of early school leavers, the share of 30-34 year-olds with tertiary education and the share of all individuals with tertiary education in Bulgaria, R&D investments, the level of employment and reducing the number of people at risk of poverty or social exclusion. The study includes results and conclusions from research part of a dissertation related to the problems of reproduction of human capital and the future development of a knowledge-based economy in Bulgaria. The aim of the study is to analyze the progress of the implementation for 4 of the targets of the National Reforms Program in Bulgaria according to "Europe 2020" strategy which correspond to requirements for the knowledge-based economy such as education, R&D, employment and reducing the poverty levels so that more people can gain access to knowledge, adequate healthcare and culture. Statistical and analytical methods are applied for the aim of the study which covers the period 2010 - 2016.

Analysis

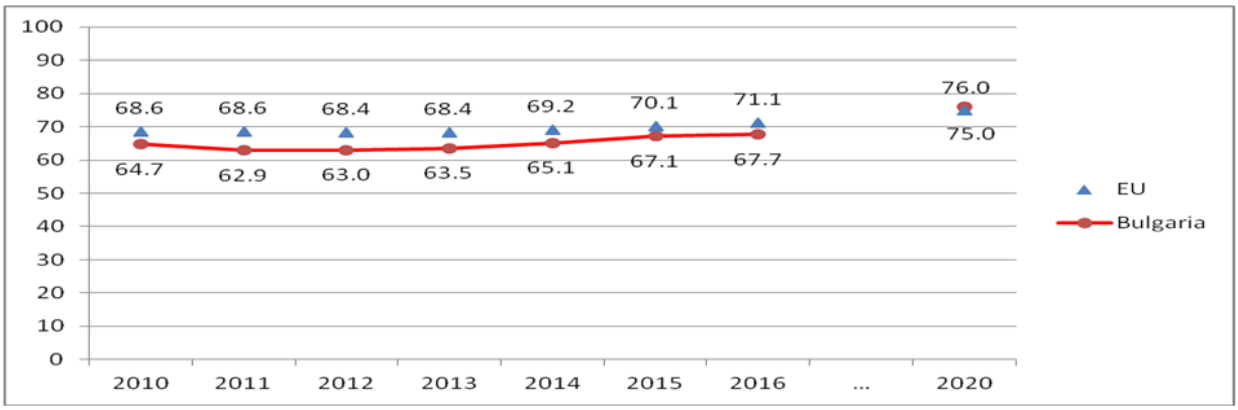
"Europe 2020" strategy identifies three priorities – 1/ Smart growth: building a knowledge-

based economy and innovation; 2/ Sustainable growth: Promoting a greener and more competitive, resource efficient economy; 3/ Inclusive growth: Stimulating an economy with high levels of employment leading to social and territorial cohesion. For measuring the progress in achieving the objectives of the strategy, five main targets for the European Union are set: 1) Employment for 75 % of the population aged 20-64; 2) R&D investments of 3 % of GDP; 3) Achieving the "20/20/20" climate/energy targets (including an additional 30 % reduction if the conditions are appropriate); 4) Under 10 % relative share of early school leavers and at least 40 % relative share of 30-34 year-olds with tertiary education; 5) Reducing the number of people at risk of poverty by 20 million people. Bulgaria's national targets for implementing the strategy are set out in the National Reform Program of the Republic of Bulgaria (updated 2017). According to it, the national target for employment following the "Europe 2020" strategy requires employment of the country's population (20-64) of 76 %. The national target for investments in R&D is 1.5 % of GDP. The national target for relative share of early school leavers is 11 % and at least 36 % relative share of 30-34 year-olds with tertiary education, and the target for reducing the number of people at risk of poverty to be reduced - by 260 thousand people in Bulgaria. In the present study the four targets (out of five) are analyzed and their progress is measured.

Results

The results from the analysis of the implementation of the first target relate to employment show that in 2016 the employment rate in Bulgaria was 67.7 % - **Diagram 1**.

Diagram 1. Employment rate in Bulgaria and EU (2010 – 2016) - %

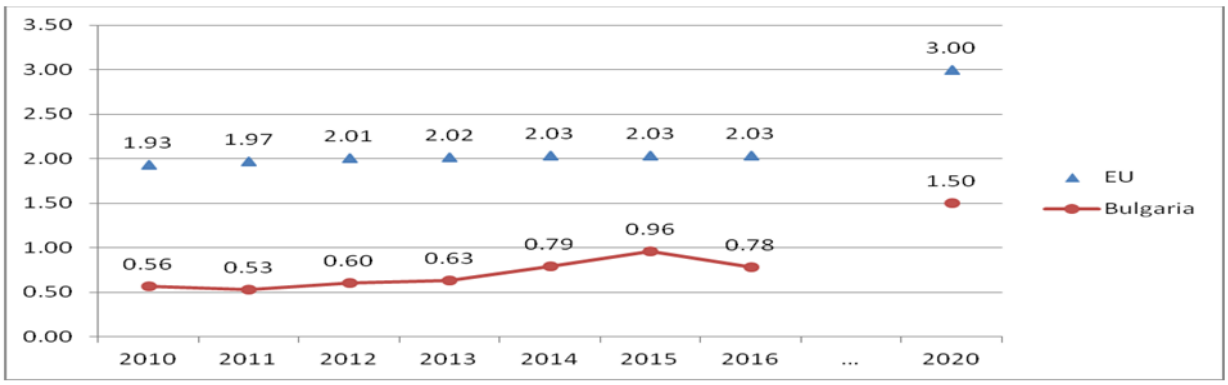


Source: National Statistical Institute – Sofia, Bulgaria

As seen on the diagram employment rates in Bulgaria and EU are very similar, but the rate for Bulgaria in 2016 is just 67.7 % while the national target for 2020 is 76.0 %. The difference is 8.3 % that should be minimized for just 4 years period. It is very likely that Bulgaria will not meet the requirements of "Europe 2020" referring to this indicator.

The second target related to the investments in R&D show that Bulgaria the R&D expenditure (% of GDP) for 2016 was 0.76 % - **Diagram 2**.

Diagram 2. R&D expenditure in Bulgaria and EU (2010 – 2016) - % of GDP

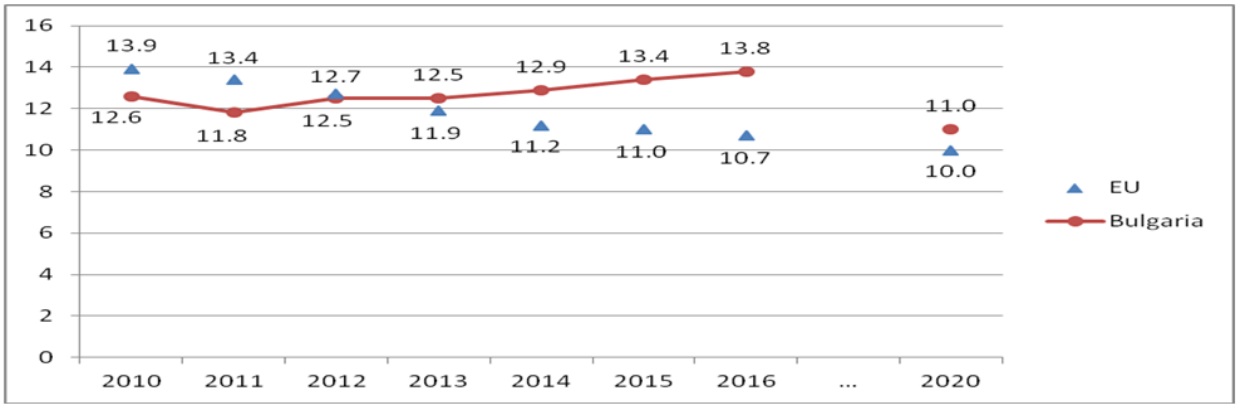


Source: National Statistical Institute – Sofia, Bulgaria

The expenditure on R&D in Bulgaria decreased from 2015 (0.96 %) to 2016 by 0.18 %. The target in 2020 is 1.50 %. The desired level of this indicator may not be possible to be achieved by 2020. But for the EU may also not be possible to achieve 3 % expenditure because of the 2016 level of the indicator – at 2.03 %. The project-oriented funding concerning "Horizon 2020" for example needs to be more simplified and by that to ensure the free and fast access of the interested scientific institutions.

The results for the third target for relative share of early school leavers is 11 % and at least 36 % relative share of 30-34 year-olds with tertiary education show that the percentage of early school leavers are raising instead of decreasing and the required level of this indicator in Bulgaria is far from its desired level in 2020 – it was 13.8 % in 2016 – **Diagram 3**.

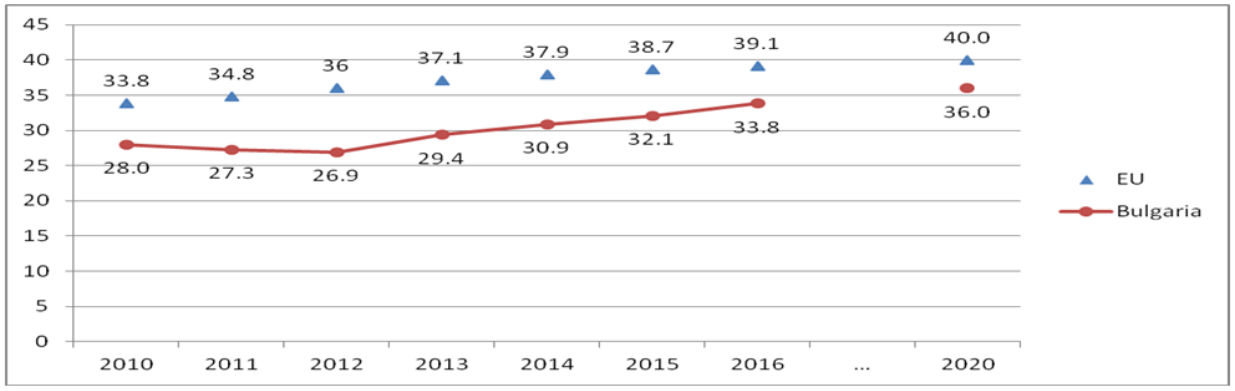
Diagram 3. Share of early school leavers in Bulgaria (2010 - 2016) - %



Source: National Statistical Institute – Sofia, Bulgaria

As seen on the diagram above the share of early school leavers in Bulgaria for the period raised to 13.8 % in 2016. Some of the main reasons for that tendency are poverty, economic migration to Western countries like Germany, UK, France, Sweden and low motivation to study amongst the minorities. Specific measures should be taken for tackling this negative tendency by the government.

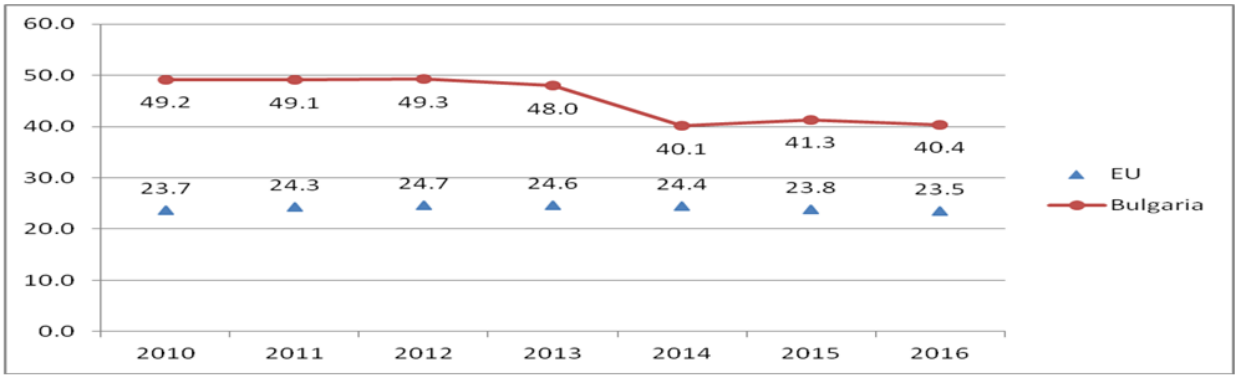
Diagram 4. Relative share of 30-34 year-olds with tertiary education - %



Source: National Statistical Institute – Sofia, Bulgaria

According to the diagram the second part of the third target is possible to be achieved by 2020. The share of 30-34 year-olds with tertiary education in Bulgaria in 2016 was 33.8 %. That is just 2.2 % below the desired value. The EU has nearly reached this target already in 2016 – 39.1 %.The population with higher education represents the educated people who will drive the economy to knowledge-based economy. The higher level of education an individual possesses, the higher income he will gain.

Diagram 5. Number of people living at risk of poverty or material deprivation (combined indicator) - %



Source: National Statistical Institute – Sofia, Bulgaria

The number of people living at risk of poverty or material deprivation is decreasing for the past few years. In 2016 it dropped to 40.4 % in Bulgaria which represent 2 million and 890 thousand people. This is almost ½ from the population of Bulgaria. The European funding should be pointed in this direction. The individuals living in poverty cannot afford simple things like access to education, adequate healthcare and culture. All this interferes with the structure of human capital and its quality.

Conclusions

The results for three of the four analyzed targets (first, third and fourth) can be achieved by the EU by 2020. The process of implementation of the national targets in Bulgaria according to the "Europe 2020" strategy shows problems in the progress and probable impossibility of reaching the first, the second and partially the third target. The delayed progress on the targets can be explained by the frequent change of governments in recent years, their different priorities and the lack of sufficient administrative capacity as there are fewer and fewer well-qualified young people with the adequate qualifications working in the institutions.

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