МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ
ДЕРЖАВНИЙ ВИЩИЙ НАВЧАЛЬНИЙ ЗАКЛАД
«ДОНЕЦЬКИЙ НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ»

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ДІЛОВА ІНОЗЕМНА МОВА

Спеціальний практикум з англійської мови
для студентів напряму підготовки
6.030502 “Економічна кібернетика”

Навчальний посібник

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У навчальному посібнику викладені сучасні професійно орієнтовані матеріали з питань економічної кібернетики. Кожен навчальний текст посібника забезпечено коротким словником і вправами, ціллю яких є засвоєння лексики даного тексту, контроль за ступенем розуміння змісту прочитаного, розвиток навичок читання та усної мови. Структура навчального посібника забезпечує формування у студентів широкого тематичного словника, активного засвоєння функціональної лексики, розвиток навичок двостороннього перекладу, тобто всіх тих умінь і навичок, які необхідні сучасному фахівцю.

Для студентів вищих навчальних закладів, що спеціалізуються за фахом економічна кібернетика.

ЗМІСТ

ПЕРЕДМОВА

Україна – країна з ринковою економікою – потребує все більше спеціалістів, які можуть працювати на міжнародному рівні. У цьому контексті особливе значення ділової англійської мови як засобу ділового спілкування набуло надзвичайної ваги в нашій країні.

Курс ділової англійської мови має на меті практичне опанування студентами системи англійської мови та нормативної базою її функціонування в комунікативно-мовленнєвих ситуаціях у різних сферах професійної діяльності.

Метою навчального посібника “Ділова іноземна мова” (англійська) є допомогти студентам практично оволодіти системою англійської мови та нормативною базою її функціонування в комунікативно-мовленнєвих ситуаціях у сфері їхньої майбутньої професійної діяльності, якісна підготовка фахівця до іншомовного спілкування в професійній сфері на основі світового досвіду та рекомендацій Ради Європи.

В основу курсу покладено принципи системності, комунікативної та професійної спрямованості навчання, інтерактивності, інтеграції та мовленнєво-розумової активності.

Засвоєння структури мови відбувається в типових комунікативних контекстах і основних видах мовленнєвої діяльності (аудіюванні, говорінні, читанні, письмі).

У запропонованому навчальному посібнику враховані основні положення документів Болонського процесу, теми розбиті на два модулі. У першому модулі розкриті еволюційні процеси в економіці, сучасний етап розвитку економіки – економіка знань. У другому модулі розкриті парадигми синергетики і теорії хаосу, управління сучасними інформаційними системами.

Навчальний посібник складається з 24 розділів, що містять сучасні професійно орієнтовані матеріали з питань економічної кібернетики. Кожен навчальний текст посібника забезпечено коротким словником і вправами, ціллю яких є засвоєння лексики даного тексту, контроль за ступенем розуміння змісту прочитаного, розвиток навичок читання та усної мови.

Запропонований навчальний посібник виконує інформаційну, орієнтуючу, пояснюючу, переконуючу і захоплюючу функції. У своїй сукупності ці функції націлюють студента на наступну самостійну роботу.

PART I. EVOLUTION AND KNOWLEDGE IN ECONOMICS

UNIT 1 EVOLUTION OF MARKETS

In a one-period competitive market, the concrete process of price formation is not precisely defined. TheWalrasian auctioneer is assumed to fix the prices as a unique signal by following a ‘Walrasian tatonnement process’ in fictitious time. He increases the price of a given good when its total demand exceeds its total supply and vice versa. But real transactions only take place once the equilibrium prices have been established; hence the material sphere and the cognitive sphere are disconnected.

Such a process is quite demanding in terms ofinformation, since all supply and demand must be known at each period. Moreover, the process does not converge in all cases towards a competitive equilibrium state. In a multi-period competitive market, the process of price formation is even more complicated, since the Walrasian auctioneer has to define the prices of all goods in all future periods.

The price formation mechanism is no better defined in a one-period market with imperfect competition, whether the adjustment is achieved mainly in quantities or in prices. A ‘Nash regulator’ is assumed to fix the quantities and prices by following a ‘Cournot tatonnement process’. The process is again demanding, since the regulator needs either to observe or to compute the best response functions. Moreover, the convergence of the everlasting process is not guaranteed. However, such a process may be followed in real time by the agents since the price is now fixed by them and not given to them by an outside entity. But these agents are then very myopic in that, in each period, neither agent considers that the other will later react to his action.

A preliminary step towards a more realistic view is to consider that the agents may learn about structural characteristics of the system in which they act, even if they are still coordinated by a fictitious entity. Learning is generally epistemic, since the agents have prior beliefs about their environment, which are revised with reference to new observations. For instance, in an imperfect market, a duopolist may have a prior belief about the demand function which he adjusts with reference to past observations, using least squares or other statistical methods (like the modeler). Likewise, in a competitive market, a consumer may revise a prior belief about the relation between the price and certain exogenous factors he observes. In fact, the learning process unfolds in a non-stationary environment, since all the agents are learning simultaneously. Nevertheless, the agents’ beliefs generally converge towards a reduced form of the actual model (that of the modeler). Some relevant variables may be missing because they are not initially considered by the agents. Such an asymptotic model is only locally rational, since it proves to be true at the equilibrium state but not elsewhere. For example, the duopolist converges towards a reduced demand function which depends only on his own price and not on the other’s. Likewise, the consumer converges towards a reduced price function relating the price exclusively to the considered environmental factors.

The main step towards more realism is achieved when the agents define their prices and quantities in each period and implement them simultaneously, without interference from any outside entity. Learning becomes frequently behavioral, since the agents adapt their actions directly to their past observed performances without expectations. For instance, in an imperfect market, a duopolist may use an original learning rule, the ‘stubborn rule’, which applies only when the action space is one-dimensional. He increases the price of his product if, in the preceding period, he increased his price and got an increased profit or if he decreased his price and got a decreased profit. Likewise, in a competitive market, a consumer and a producer may propose their own prices (adapted to past observations) and the transaction takes place at some intermediate price if the announced prices are compatible.

In fact, the learning process acts as if the Walrasian auctioneer or the Nash regulator were distributed among the agents. The process converges, under certain standard conditions, towards the equilibrium prices. However, the prices remain dispersed among the agents if theinformation, negotiation or transaction costs are too high. For instance, the duopolists converge towards the Cournot equilibrium state with various learning rules, but they converge towards the collusion equilibrium with the stubborn learning rule. Likewise, producers and consumers often converge towards the competitive equilibrium price system. More profoundly,

the learning process may lead to the design of an endogenous network among agents. For instance, in a fish market, buyers and sellers may progressively establish lasting relations of loyalty (Weisbuch, Kirman).

In the employer-employee example, different adjustment rules are available, inducing various transaction costs. For instance, if an employer finds a worker who is prepared to accept a lower wage, he asks the current employee if he will work at that wage, and if the employee refuses, he replaces him by the other. When considering many pairs of agents, in each period, each one searches for new partners, changes or keeps his partner according to the above rule and adjusts his reserve wage accordingly. Over the long term, wages converge towards the equilibrium wages when there are no costs of any kind. When there are search costs, on the contrary, the process may converge towards a segmentation of prices in several areas. Likewise, when there are transaction costs, the prices may remain within a certain interval without being unique.

VOCABULARY NOTES

a total demand – совокупный спрос;
a total supply – совокупное предложение;
a equilibrium prices – равновесные цены;
a imperfect competition – несовершенная конкуренция;
the best response function – оптимальная функция отклика;
the demand function – функция спроса;
adjust – регулировать;
observation – исследование;
least squares – наименьшие квадраты;
exogenous factors – внешние факторы;
equilibrium state – состояние равновесия;
to converge – сходиться в одну точку; стремиться (к пределу);
to disperse – рассеиваться, рассредоточиваться;
negotiation – переговоры;
the Cournot equilibrium state – состояние равновесия Курно;
intermediate price – промежуточная цена.

Assignments

I. Suggest the Russian equivalents

To fix the price, real transactions take place, the cognitive sphere, the process converge, the adjustment is achieved, equilibrium state, the prices dispersed, the considered environmental factors, to accept a lower wage, the convergence of the everlasting process.

*II. Replace the parts in **italics** by synonyms*

Auctioneer is *assumed* to fix the prices; the process does not *converge*; to *compute* the best functions; which are *revised* with reference; variables may be *missing*; the agents *adapt* their actions; regulator were *distributed*.

III. Fill in the gaps -with the words and expressions/ran the text

1. He _____ the price of a given good when its _____ demand exceeds its _____ supply and vice versa.
2. In a multi-period _____ market, the process of _____ formation is even more complicated
3. A ‘Nash regulator’ is _____ to fix the quantities and prices by following a ‘Cournot tatonnement process’.
4. In an imperfect market, a duopolist may have a _____ belief about the _____ function
5. In a _____ market, a consumer may revise a _____ belief about the _____ between the price and certain exogenous factors.
6. The agents _____ their actions directly to their past observed performances.
7. The ‘_____ rule’, which _____ only when the action space is one-dimensional.
8. Such an asymptotic model is only locally rational, since it _____ to be true at the _____ state but not elsewhere.

9. The process _____, under certain standard conditions, _____ the equilibrium prices.
10 In a fish market, _____ and _____ may progressively establish lasting relations of loyalty.
11. In a competitive market, a consumer and a producer may _____ their own prices.
12. An employer _____ a worker who is prepared to accept a lower _____.
13. Over the long term, wages _____ towards the _____ wages.
14. Such a process may be _____ in real time by the agents.

IV. Find in the text English equivalents/or the following
Конкурентный рынок; функция отклика; несовершенная конкуренция; нестационарная среда; сокращенная форма; возрастание дохода; наименьшие квадраты; наемный работник; регулировать резервы; трансакционные издержки; оставаться в рамках определенного интервала; стандартные условия.

V. Give explanations in English
The material sphere; to converge; equilibrium state; transaction costs; the competitive market; to disperse; the environmental factors; the demand function; the standart condition.

VI. Answer the questions
1. In such cases can we increase the price of a good?
2. Why do the process of price formation is such complicated in a multi-period competitive market?
3. Why is the price formation mechanism no better defined in a one-period of market?
4. What is meant by 'stubborn rule'?
5. What adjustment rules do you know between employer-employee, pairs of agents?

VII. Translate using all the active possible
1. Рынок находится в равновесном состоянии, если совокупный спрос равен совокупному предложению.
2. При совершенной конкуренции на рынке имеется большое число покупателей и продавцов, каждый из которых занимает малую долю на рынке и не может диктовать условия продажи и покупки товаров.
3. Если работодатель находить работника, который готов принять более низкую зарплату, он спрашивает текущего сотрудника, готов ли он работать на эту зарплату, если работник отказывается, работодатель заменяет его другим.
4. В условиях конкурентного рынка, потребитель и производитель могут предлагать свои цены, в таком случае сделка состоится в какой-то промежуточной цене, удовлетворяющая обе стороны.

VIII. Make up the dialogue
You accept for employment an accountant. Try to explain her/him what she/he have to do and ask about her/him knowledge.

IX. Additional exercise
Write letter about your plans on the works in future.

UNIT 2 EVOLUTION OF THE AGENT'S KNOWLEDGE

From the agent's point of view, the economic system is evolving over a personal, subjective timescale. Subjective time is less *homogenous* than physical time, since it is concentrated around the present time and its *reference point* is mobile. As concerns past events, they are integrated into the agent's memory. It is frequently stated that there exists a discount rate such that events are considered less and less as their distance in the past increases. For instance, a consumer values his most recent experiences of a good more than his older experiences. As concerns future events, they are integrated into his *prospective mind*. Again, it is said that there exists a discount rate such that expected events are considered less and less as their distance in the future increases. For instance, a firm considers more the *short-term* than the *long-term effects* of a certain investment.

An agent **receives** new information through different **channels**, about different variables and at different times. He experiments passively when information is just a *by-product* of his actions, for instance when he observes another's past purchases or when he experiences the satisfaction induced by a newly-tested good. He experiments actively when he performs specific operations with the aim of obtaining information. For instance, a consumer visits various different shops to compare the prices of a good he wants to buy. As usual, he may trade off between exploration for new information and exploitation of existing information, even if the *trade-off* is not optimal. As another example, a producer may vary the price of his product through successive adjustments in order to learn the *demand function* he faces.

An agent modifies his structural knowledge at short term by using belief revision rules. He may simply adjust the parameters of a model of his environment in keeping with his observations. For instance, a consumer may **discover** the quality of a good for food by observing the demand of another consumer who knows the quality. However, he may hold his theories for a long time before observing that they are refuted. For instance, a consumer may believe for years that the price of some high technology good is *regularly decreasing* before he observes he is wrong. More profoundly, an agent may define a model of his environment by means of abductive reasoning from data. For instance, a firm may discover the behavior function of some other producer in order to adapt or even to imitate him. Of course, the revealing process is still *ambiguous and strategic considerations* are involved in it. For instance, if a firm learns that its opponent is employing more workers in a depressed economic climate, it then has to interpret such behavior.

Finally, an agent modifies his expectations by changing his expectation rules. An expectation rule may be based on a more or less *crude model* of his environment. For instance, a firm forecasts the future price of oil by means of a sector-based model *simulating an equilibrium* between supply and demand. Due to *bounded rationality*, the expectation rule may directly relate the expected variable to its past values. For instance, a consumer **predicts** future prices by means of an adaptive rule, stated in order to reduce the forecasting error. In general, several rules are used simultaneously by different agents to forecast the same variable. For instance, on a financial market, if 'fundamentalists' predict the future price of an asset with reference to its future returns, 'chartists' use rules based on regularities observed in the past.

The agents consider that the evolution process obeys the same types of laws or models as the modeler does. However, the agent is **induced** to *distort or simplify certain explanative **schemes***. Firstly, he is 'egocentric' in that he attributes any change to himself, to nearby agents or to their common context. For instance, a producer considers that a new technology has been obtained by his own research, by neighboring firms or by academic laboratories which are out of his control. Secondly, he is '*myopic'* in that he considers that the slow variables are fixed and that only the fast variables are evolving. For instance, a consumer considers that the prices he observes are exogenous even if he knows that he has some (small) influence on them. In particular, an agent generally considers *emergent phenomena* as natural phenomena that he cannot influence.

Globally, like his material capital, an agent's immaterial capital evolves in different ways. Firstly, knowledge is increased by *incorporating successive pieces of information* into it. For an individual, immaterial capital develops through education or training, while for a firm, **immaterial** capital develops through research and **development** or in-house training. Secondly, knowledge is enriched by the *autonomous internal reasoning* performed on it. For an individual, knowledge is transformed by deduction or induction processes; for a firm, knowledge is transformed by redesigning its organization scheme. Thirdly, knowledge can shrink through some kind of *cognitive obsolescence*. For an individual,

knowledge disappears through memory failure; for a firm, knowledge disappears through the *loss of skilled agents* or the *inaccessibility of artificial memories*.

In the employer-employee example, over the medium term, their information is modified by *deliberate search*. The employer looks for new workers prepared to work in the existing jobs for *lower wages*. The employee looks for jobs outside the firm for which he would be better paid. Each agent conducts his search in a neighborhood and may even limit his search to a sample of that neighborhood. In doing so, he faces relatively high search costs. Over the long term, informational or mediation **devices** may appear. For instance, employment agencies may be created to diffuse information about available jobs and so favor the adjustment of supply and demand.

VOCABULARY NOTES

a personal, subjective timescale – индивидуальная, личная шкала времени (масштаб времени)
homogenous – однородный
reference point – ориентир, точка отсчёта
discount rate – учётная ставка
prospective mind – будущее мышление, память
short-term /long-term effects – кратковременные/отдалённые последствия
by-product – побочный продукт
trade off – обмен, альтернатива, компромисс
demand function – функция спроса
regularly decreasing – постоянно убывающая
ambiguous and strategic considerations – сомнительные (неоднозначные) и стратегически важные соображения
crude model – грубая (приближённая) модель
simulating an equilibrium – моделирование равновесия (баланса)
bounded rationality – ограниченная рациональность
to distort or simplify certain explanative schemes – искажать и упрощать определённые схемы (проекты)
myopic – близорукий
emergent phenomena – возникающий феномен
incorporating successive pieces of information – объединение последовательных порций (частей) информации
autonomous internal reasoning – самостоятельные (независимые) внутренние рассуждения (умозаключения)
loss of skilled agents – потеря опытных (квалифицированных) агентов
inaccessibility of artificial memories – недоступность искуственной памяти
cognitive obsolescence – когнитивное (познавательное) устаревание (износ)
deliberate search – тщательный поиск
low wages – низкая заработная плата

Assignments

I. Suggest the Russian equivalents

Subjective time; agent's memory; discount rate; newly-tested good; with the aim of obtaining

information; to compare the prices of a good; exploration for new information; exploitation of existing information; observing the demand of another consumer; to define a model of his environment; expectation rule; to face relatively high search costs; to shrink through some kind of cognitive obsolescence.

*II. Replace the parts in **italics** by synonyms*

to *forecast* future prices; agent *gets* new information through different *sources;* a consumer may *find out* the quality of a good for food; the agent is *forced* to distort or simplify certain explanative *layout*; *inessential* capital develops through research and *progress* or in-house training; informational or mediation *gear* may appear.

III. Fill in the gaps -with the words and expressions/ran the text

1. _____ time is less homogenous than_____ time, since it is concentrated around the present time and its reference point is mobile.
2. As usual, he may trade off between _____ for new information and _____ of existing information, even if the _____ is not optimal.
3. An agent modifies his structural knowledge at _____ term by using belief revision rules.
4. However, he may hold his theories for a long _____ before observing that they are refuted.
5. An _____ rule may be based on a more or less crude _____ of his environment.
6. A consumer may discover the _____ of a good for food by observing the demand of another _____ who knows the quality.
7. From the agent's point of view, the economic system is evolving over a _____, _____ timescale.
8. For instance, a consumer considers that the prices he observes are _____ even if he knows that he has some (small) influence on them.
9. In general, several _____ are used simultaneously by different agents to forecast the same _____.
10. For an _____, immaterial capital develops through education or training, while for a _____, immaterial capital develops through research and development or in-house training.
11. For an individual, knowledge disappears through _____ failure; for a firm, knowledge disappears through the _____ of skilled agents or the inaccessibility of _____ memories.
12. The employee looks for jobs outside the firm for which he would be _____ paid.

IV. Find in the text English equivalents/or the following

физическое время; точка отсчёта; учётная ставка; сравнивать цены на товары, которые ты хочешь купить; изучение новой информации; использование существующей информации; обмен является оптимальным; уменьшить ошибку прогноза; раскрытие поведенческой функции для адаптации или подражания ей; потеря квалифицированных агентов; затраты на поиск; доступная работа

V. Give explanations in English

Subjective time; long-term effects; by-product; trade off; demand; forecast; to simplify scheme; simulating an equilibrium; an asset.

VII. Answer the questions

1. What is the difference between subjective time and physical time?
2. How does an agent modify his structural knowledge at short term?
3. Why does a firm discover the behavior function of some other producer?
4. A firm forecasts the future price of oil by means of a sector-based model simulating an equilibrium between selling and demand, doesn't it?
5. Does immaterial capital develop for an individual through research and development or through education and training?
6. Why are the employment agencies created?
7. For a firm, knowledge disappears through memory failure and the loss of skilled agents, doesn't it?
8. What is knowledge enriched by?

VIII. Translate using all the active possible

1. Агент вынужден искажать и упрощать определённые схемы с прогнозирования будущих цен.
2. Агент изучает новую информацию, сравнивает цены на товары, исследует поведенческую функцию конкурентов для достижения баланса (равновесия) на рынке.
3. Потребитель узнаёт (обнаруживает) качество товара, наблюдая за спросом других потребителей на этот товар.

IX. Make up the dialogue

You are going to rent an apartment. Ask the owner about property features of the house.

X. Additional exercise

Write a letter to you foreign friend.

UNIT 3 EVOLUTION OF THE MODELER'S MODEL

The economic system evolves over time, in its different manifestations. Time is generally considered as an extra-economic and exogenous variable supporting the evolution of the system. It is considered as continuous for many theoretical models, since most phenomena display a great deal of inertia. Economic growth, for example, is quite regular, even if some accelerations and decelerations are observable. But time can be discrete when exogenous phenomena create natural periods which influence economic operations. Agricultural production, for example, follows annual climatic and vegetative cycles, and market prices fluctuate accordingly.

The main properties of basic economic entities may change over the short-term, shifting from one class to another in the basic taxonomies. Goods evolve in terms of their quality through technological and social innovation. The technical or esthetical characteristics of cars, for example, are continually being modified. Agents see their determinants modified, due to exogenous factors, past experience or age. This is especially true for preferences, which vary at long term as to the relative weight attached to partial criteria, discount rates or aspiration levels.

Institutions change their nature and even their function. Money, for example, successively adopts different supports while keeping its role as a means of transaction. Relations are redistributed as regards their configurations and supports. For instance, coalitions between airlines are reconsidered and reshaped in changing circumstances.

The basic entities also evolve through the creation of new kinds and the extinction of old ones, giving rise to new taxonomies. New sorts of goods become available while old ones disappear. For instance, new labor qualifications are defined, traditional craftsmen being replaced by computer specialists. New types of agents enter the market while others exit. For instance, temporary employment agencies are appearing while traditional unions disappear.

New kinds of institutions are created or result from the splitting or unification of old ones. For instance, new financial markets and new auction mechanisms are set up while old tax systems are reshaped. Finally, new forms of relations appear while old ones are abandoned. The web, for instance, has created a completely new system of relations on a worldwide scale.

The evolution of the economic system is subject to nested time scales, since some variables adapt faster than others. For instance, institutions are more stable than economic agents, economic agents are more stable than their determinants, and their preferences are more stable than their representations. The slow variables influence the fast variables over the short term, while the fast variables shape the slow variables over the long term. For example, producers determine their production levels on a short-term basis, but adapt their goods, technologies or prices over the long-term.

For the modeler, the transformation of entities is generally attributed to explaining factors which may be either causal or intentional. For instance, new means of transportation act on economic activity in a causal way, while new technological devices act on a firm's structure in an intentional way. Globally, all factors act together in a systemic way and contribute to the production of economic effects regulated by positive or negative feedbacks.

A special feature of evolution is the existence of 'emergent phenomena' arising at a social level. An emergent phenomenon is a phenomenon which looks surprising to the modeler in relation to the basic entities, but may nevertheless be explained. Emergence is synchronic when it results instantaneously from the basic entities and diachronic when it appears progressively. It is unidirectional when it results solely from the bottom-up influence of the basic entities and bi-directional when there is a top-down feedback on the basic entities.

In the employer-employee example, agents' preferences are adjusted over the short term according to the easiness of finding a job. If the employer can easily find another employee prepared to work at the given wage, he lowers his reserve wage, and vice versa. If the employee can easily find a new position, he increases his reserve wage, and vice versa. In doing so, both agents face low adjustment costs. Over the long term, more profound transformations are taking place. New types of agents like unions appear with the aim of mediating the relation between the supply and demand of labor. New institutional rules are expressed, especially as concerns the hiring and firing conditions of workers by firms.

VOCABULARY NOTES

manifestation – проявление

observable – заметный
fluctuate – колебаться
entity – объект
shifting – меняющийся
taxonomies – систематика, классификация
determinant – определяющий элемент, детерминант
relative weight – относительный вес
aspiration level – уровень устремлений
successively –непрерывно, постепенно
means of transaction – средство соглашения
extinction – исчезновение
temporary employment agencies – агентство временного найма
splitting – расщепление
unification – объединение
abandoned – оставленный
worldwide scale – общемировой масштаб
time scales – шкала времени
slow variables – медленно изменяющиеся величины
equilibria - равновесие
causal - случайный
intentional – умышленный
contribute – содействуют
feedbacks – обратная связь
emergent phenomena – новое явление

ASSIGNMENTS

1. Suggest the Russian equivalents
Evolves over time; market prices fluctuate accordingly; especially true for; adopts different supports; relations are redistributed as regards their configurations and supports; kinds of institutions are result from; tax systems are reshaped; production level; the transformation of entities.

2. Replace the parts of *italics* by synonyms.
Evolves over time in different *manifestations*; means of *transaction*; new forms of relations appear while old ones are *abandoned*; institutions are more *stable* than economic agents; all factors contribute to the production of economic effects regulated by positive or negative feedbacks; special feature of evolution; *emergence* is synchronic when it results *instantaneously* from the basic entities; agents' preferences are *adjusted* over the short term.

3. Fill in the gaps with the words and expressions/ran the text.
1. Time is generally considered as an ___ and variable supporting the evolution of the system.
2. Goods evolve in terms of their quality through technological and social ____.
3. Agents see their determinants modified, due to _____ _____, _____ or age.
4. Coalitions between airlines are _____ and _____ in changing circumstances.
5. New sorts of goods become _____ while old ones _____.
6. The web has created a completely new system of relations on a __ _____.
7. Institutions are more stable than ____ , economic agents are more stable than their _, and their preferences are more stable than their _____.
8. New means of transportation act on economic activity in a _____ way, while new technological devices act on a firm's structure in an _____ way.
9. All factors act together in a _____ way.
10. Factors contribute to the production of economic effects regulated by positive or negative _____ _____.
11. _____ is synchronic when it results instantaneously from the basic entities and diachronic when it appears progressively.
12. If the _____ can easily find another _____ prepared to work at the given wage, he lowers his

reserve wage.

13. If the employee can easily find a new position, he _____ his reserve wage.

14. New types of agents like unions appear with the aim of _____ the relation between the supply and demand of labor.

15. Producers determine their production levels on a basis, but adapt their goods, technologies or prices over the _____ one.

4. Find in the text English equivalents/or the following.

Развиваться во времени; рыночные цены колеблются соответственно; основные субъекты экономики; учетная ставка; изменяющиеся обстоятельства; создание и исчезновение новых субъектов; агентство временного найма; производители определяют уровень производства в краткосрочном периоде, а цены устанавливают на долгосрочный период; факторы содействуют получению экономического эффекта; предложение и спрос рабочей силы.

5. Give explanations in English.

Extra-economic and exogenous variable; inertia effect; accelerations and decelerations; discrete time; the web has created a completely new system of relations on a worldwide scale; slow variables and fast variables; causal or intentional factors; emergent phenomena.

6. Answer the questions.

1) How can you consider the time as variable?
2) What does change their nature and function?
3) Why do new sorts of goods become available while old ones disappear?
4) How are new kinds of institution created?
5) Do some variables adapt faster than others? Why?
6) What is the slow variable?
7) What is the different between causal and intentional factors?
8) Where is ‘emergent phenomena’ arising?
9) How can you explain the ‘emergence’?

7. Translate using all the active possible.

1) Экономический рост достаточно стабилен даже, несмотря на имеющиеся ускорения и замедления.

2) Деньги непрерывно принимают различную поддержку во время выполнения своей роли как средство соглашения.

3) Институты более устойчивы, чем экономические агенты, экономические агенты более устойчивы, чем их определяющие элементы.

4) Если рабочий легко может найти новое рабочее место, он повышает свою заработную плату и наоборот.

8. Make up the dialogue.

You are going to find a new job. Explain to your friend why you don’t like your present position and describe new one.

9. Additional exercise.

Write a summary.

UNIT 4 MITIGATION AND CONTROL

After the risk exposure has been assessed, the next step is to consider how one deals with it. Continuing with our street-crossing example, one possibility would be to avoid the risk entirely and not cross the street at all (a wise strategy if the road in question were, say, Interstate 94 at rush hour). Alternatively, if we decide to proceed, the question might be the following: do we jaywalk and cross the street now, or stroll down to the traffic signal and wait for the green light? Each of these alternatives represents an economic decision, weighing the cost of the strategy against the potential benefits. Generically, mitigating a risk exposure entails the identification of tactics either to reduce the probability of a bad outcome, or to reduce the magnitude of a loss, should a bad outcome occur. The former types of activities, referred to as *loss prevention* measures, would include the cross-at-the-intersection option discussed above, or, in a more mundane industrial setting, the inspection of electrical wiring to reduce the probability of an electrical fire. Indeed, most of the risk mitigation strategies that come easily to mind are designed to keep us out of trouble in the first place - don't put the gasoline can next to the furnace, don't smoke in bed, lock your doors before you retire for the night. *Loss reduction*, on the other hand, describes the class of risk mitigation activities designed to reduce the magnitude of a loss, should one occur.

The standard example here would be the installation of sprinklers in a warehouse, which doesn't reduce the probability of a fire starting but, rather, mitigates the damages that result from the fire. The explosion of boiler number six at the River Rouge powerhouse occurred during a maintenance shutdown. As far as can be determined, a valve unintentionally left open allowed natural gas to flow into the boiler, which was quickly ignited by the electrostatic scrubbers located in the boiler's chimney. In retrospect, it appears that the tragedy stemmed from a lack of attention paid to issues of risk mitigation during routine episodes of maintenance. Not only was the act of shutting down the boilers rare, but apparently there were no written procedures or checklists to guide the process. Employees who had not been trained in shutting off the boilers and who had last received an equipment manual in 1997, had to shut off over 30 (unlabeled) natural gas valves throughout the powerhouse complex. They missed one, and the rest is history. We make trade-offs in our personal and business lives between the burden of risk exposure and the cost of risk mitigation. Financing the costs associated with a bad outcome becomes the question. In personal settings, the risk financing strategy generally adopted is that of risk shifting to a third party, usually an insurance company (think about the collision and liability insurance on your car, homeowner's insurance, or the warranty on a new appliance). The problem with this type of risk transfer, though, is that it creates what is known in economics as a "moral hazard."

A colleague of mine kept a sailboat moored off the end of his dock on Long Island Sound. One day, during casual conversation, I asked about his strategy for dealing with storms and the like - as a boat owner myself, I was aware (risk identification and quantification) of the effects of heavy wave action on a boat banging against a dock. He responded that he wasn't worried because he had insurance and he never took the boat out of the water until the end of the season. The problem here, of course, is that if one is fully insured against a loss, then one has no incentive to take (privately costly) actions to reduce one's risk exposure. Insurance companies, not surprisingly, have figured this out.

When my teen-aged son finally made enough money to purchase a car, it turned out that the machine of his dreams was a 1994 Camaro Z28, with a 5.7 liter V-8 engine and 270 horsepower. You might think that no insurer in their right mind would write coverage in a situation like this, but you would be wrong. An automobile insurer in Michigan was willing to provide liability coverage at a finite premium. But, there was a catch - no coverage for collision damage.3 Effectively, he has a 100 percent deductible if he wraps the car around a tree. This retained risk has "incentivized" my son to drive carefully. This is generally the trade-off that you will find in your personal and professional risk financing decisions - increased investment in risk elimination reduces the premiums you pay per dollar of coverage, but the down side is that you are exposed to more risk.

VOCABULARY NOTES

Jaywalk – зевать
Stroll down – спуститься вниз
Mitigating – смягчение, снижение

Former types – прежние типы
Reduction – потери
Warehouse – склад
Valve – клапан
Ignite – зажигать
Chimney – труба
Third party – третье лицо
Warranty – гарантия
Sailboat – парусная лодка
Moor off – пришвартоваться
Deductible - франшиза

Assignments

I. Suggest the Russian equivalents

Former types of activities, exposure, assess, proceed, moored, figured this out, mitigation, risk exposure, reduction, magnitude, deductible, trade-off, unintentionally, sailboat, maintenance, guide the process, liability insurance, appliance.

*II. Replace the parts in **italics** by synonyms*

Warranty on the new appliance, *figured* this *out, stroll* down to the traffic signal, costs *associated* with, he *responded* that, the *burden* of risk, for collision *damage*

III. Fill in the gaps -with the words and expressions/ran the text

1 You might think that ___ insurer in their right mind _____ write coverage in a situation like this, but you _____be wrong

2 The standard example here would be the installation of sprinklers in a warehouse, _____ doesn't reduce the probability of a fire starting but, rather, mitigates the damages that result from the fire.

3 Effectively, he has a 100 percent _____ if he wraps the car around a tree.

4 We make _____ in our personal and business lives between the burden of risk exposure and the cost of risk mitigation.

5 The explosion of boiler number six at the River Rouge powerhouse _____ during a _____ shutdown

6 The problem here, of course, is that ___ one is fully insured _____ a loss, then one has no incentive to take (privately costly) actions to reduce one's risk exposure.

7 Alternatively, ___we decide to proceed, the question might be the following: do we _____ and cross the street now, or stroll down to the traffic signal and wait for the green light?

8. *Loss* _____, on the other hand, describes the class of risk mitigation activities designed to _____ the magnitude of a loss, should one occur.

9 Indeed, most of the risk mitigation _____ that come easily to mind are designed to keep us _____ of trouble in the first place - don't put the gasoline can next to the furnace, don't smoke in bed

10 In _____ settings, the risk financing strategy generally adopted is that of risk shifting to a third _____, usually an _____ company

11 The problem with this type of risk _____, though, is that it creates what is known in economics as a "moral _____."

12 I was aware ___the effects of heavy wave action on a boat banging _____ a dock.

13 Not only was the act of shutting down the boilers rare, but apparently there were no written _____ or checklists to _____ the process

14 There was a catch—no coverage for _____ damage

15 This retained risk has " _____" my son to drive carefully.

IV. Find in the text English equivalents/or the following

Натыкающийся на, франшиза, обслуживание, полностью, обмены, гарантии на новые

приборы, затраты связанные с…, страхование ответственности, немаркированный, конечная премия, приобрести машину, моральная опасность

V. Give explanations in English

Mitigation, risk exposure, reduction, magnitude, deductible, trade-off, unintentionally, sailboat, liability insurance, third party

VII. Answer the questions

1. What does mitigation a risk exposure entail?
2 What kind of risk does loss reduction describe?
3 What has “incentivized” his(her) son to drive carefully?
4. Who is a third party as usual?
5 Why wasn’t man worried about his sailboat?

X. Additional exercise
Write about your own experience connected with risk control.

IX. Make up the dialogue

Discuss about methods of mitigating a risk exposure

UNIT 5 IDENTIFICATION AND QUANTIFICATION OF RISK

Webster's dictionary defines risk as "the chance of injury, damage, or loss." Unlike, say, a portfolio of stocks, which has a potential for gain, risks present only a down side. A risk is a chance of something bad occurring and, hence, to be avoided. Of course, even bad things can provide a profit opportunity to somebody—the city taxes me to haul away my garbage, thereby providing employment, and the "Orkin Man" is happy to fumigate my house, for a fee. But I do not generally bring home extra garbage or encourage termites to infest my house. Nor do sensible people seek out risk. However, risk can be managed. This chapter lays out the key elements of risk management: identification and quantification, mitigation and control, financing, and catastrophe planning.

Given that risks are endemic in our uncertain world, adopting appropriate strategies to deal with risk exposures and their consequences is an everyday task. Consider the case of the pedestrian contemplating crossing a busy street. The first step is to identify the risk (speeding automobiles with distracted drivers chatting on cell phones?) and to quantify its magnitude (scrapes? bruises? broken bones? fatalities?). This mundane task is the critical point of departure for one crafting a risk management strategy—remember the old aphorism that "forewarned is forearmed," which is probably the best piece of cheap advice that a risk manager can give.1 In the business setting, many kinds of risk are identifiable, even to the most uninitiated. Dangerous machinery or exposed electrical wiring in a factory setting, or slippery floors in an office or retail establishment (squashed grapes on the floor are a grocer's nightmare) are obvious examples. Other types of risk exposures may be less apparent and discernible only to those with experience in a particular area of risk analysis. Much as standing under a tree during a thunderstorm may seem reasonable to those unfamiliar with lightning, risk exposures may not be apparent to an untrained eye.

In the case of the Ford Rouge power plant, for example, there were certainly engineering advantages associated with the consolidation of production of the electricity, steam, and high-pressure air required by the entire Rouge complex. But the risks of this approach also turned out to be substantial, as the events of February 1999 attest.

Perhaps the most insidious risks facing businesses these days, however, come from evolving legal rules, as we have observed in the case of environmental liability and asbestos exposure. The Comprehensive Environmental Response, Compensation and Liability Act, the 1980 Superfund hazardous substance clean-up legislation, introduced strict liability that may involve several entities jointly for cleaning up hazardous waste sites. As a consequence of this new legal reality, a business could have been in full compliance with all applicable laws at the time of the waste disposal, or simply be the current owner of an existing site, yet still be strictly liable for the costs of clean-up. Even partial contributors to the site are fully liable for the entire cost of clean-up, due to joint and several liability,2 leading to the predictable prospecting for "deep pockets" by enterprising tort attorneys. These liabilities also may be inherited, which makes mergers and acquisitions problematic these days. Asbestos exposure also provides an instructive example. Fifty years ago, most people had little understanding of the health risks associated with airborne asbestos fibers in the workplace, and exposure standards reflected this. Over time, however, it became increasingly clear that asbestosis (a close cousin of the black lung disease suffered by coal miners) and mesothelioma (an untreatable cancer of the lung or stomach lining that is both swift and invariably fatal) were associated with workplace exposures. The result has been an explosion of litigation (estimated potential: 1.3 to 3.1 million claims) with expected asbestos liabilities of $200 billion, of which $78 billion will be borne by the affected companies and the rest by their insurers (Parloff 2002). Litigation has already destroyed the primary producers of asbestos — Johns-Manville, Unarco, and Raybestos Manhattan all declared bankruptcy long ago—and has moved on to bankrupt companies that merely purchased asbestos products, including Babcock & Wilcox, Owens Corning, GAF, and W.R. Grace. Currently in the crosshair of asbestos litigation are Georgia-Pacific (involving gypsum products), 3M (for allegedly failing to warn that the dust masks wouldn't work if improperly used), and Ford (for exposures related to the asbestos used in brakes). Federal-Mogul Corp., an automotive supplier, recently sought Chapter 11 bankruptcy protection because of an asbestos liability inherited from its 1998 acquisition of T&N PLC of Manchester, England, a company that had used asbestos in a separate building supplies business. At the time of the acquisition, Federal-Mogul set aside $2.1 billion in cash to cover the anticipated claims, a sum that in retrospect seems to have been nowhere near enough. Daniel S. Sobczynki, the former Director of Corporate Insurance for Ford, put it best: "The highest potential risks are those that are unidentified and unmanaged. It is critical to evaluate your risks and to learn from the lessons of others," he says. "The

problem of learning from personal experience is that it gives you the lesson after the test has been administered”

VOCABULARY NOTES

Gain – прибыль
Endemic – местный
Magnitude – величина
Pedestrian – пешеход
Retail – розничный
Insidious – коварный
Evolving rules – правовые нормы
Prospecting – разведка
Fiber – волокно
Insurer – страховщик
Supplier – поставщик
Set aside – откладывал
In cash – в наличный
Anticipated claim – ожидаемые требования

Assignments

I. Suggest the Russian equivalents

identification and quantification, mitigation and control, forewarned is forearmed, be less apparent and discernible, legal rules, with expected liabilities, anticipated claims, set aside, an automotive supplier, the most insidious risks, the best piece of cheap advice

*II. Replace the parts in **italics** by synonyms*

moved on to bankrupt, anticipated *claims,* the highest *potential* risks, something bad *occurring, lays out* the key elements, risks of this approach also *turned out* to be substantial, it became *increasingly* clear

III. Fill in the gaps -with the words and expressions/ran the text

1 Webster’s dictionary defines risk ___“the chance of injury, _____, or ___.”
2 The problem of learning from personal _____ is that it gives you the lesson after the ____has been _____
3 Litigation has already _____ the primary producers of asbestos and has _____ on to bankrupt companies that merely purchased asbestos products
4 There were certainly engineering _____ associated with the consolidation of production_____ of the electricity, steam, and high-pressure air _____ by the entire Rouge complex
5 I do not generally _____ home extra garbage or _____ termites to _____ my house.
6 Perhaps the most _____ risks facing businesses these days, however, come from evolving legal _____, as we have observed in the case of environmental _____ and asbestos exposure
7 A _____ is a chance of something bad occurring and, _____, to be avoided
8 Even _____ contributors to the site are _____ liable for the entire cost of clean-up, due to joint and _____liability
9 At the time of the _____, Federal-Mogul set aside $2.1 billion in cash to _____ the anticipated claims, a sum that in retrospect seems to have been _____- near enough
10 These liabilities also may be inherited, which makes _____ and _____ problematic these days
11 The highest potential risks are those that are _____ and_____
12 The risks of this approach also turned out to be _____, as the _____ of February 1999 attest.

V. Give explanations in English

Mergers, acquisitions, experience, bankruptcy , supplier, potential risks, manage, liability, legal rules

VI. Find in the text English equivalents for the following

потенциальный риск, слияние, ответственность, ожидаемые требования, обеспечивая занятость, страховщик, тяжба, приобретение, могут быть унаследованы, действующие законы, уменьшение и контроль, наводнять мой дом, быть существенными

VII. Answer the questions

1 What definition of risk does Webster's dictionary give?
2 What elements of risk does this chapter lay out?
3 What exposure does provide an instructive example of risk?
4 Does risk or liabilities make mergers and acquisitions problematic these days?
5 What has already destroyed the primary producers of asbestos?

VIII. Translate using all the active possible

1 риск — понятие, имеющее отношение к человеческим ожиданиям наступления событий, оно может обозначать потенциально нежелательное воздействие на актив или его характеристики, которое может явиться результатом некоторого прошлого, настоящего или будущего события.

2 Угроза — это очень низкая вероятность серьёзного события, которую некоторые аналитики могут быть неспособными оценить при оценке риска, потому что это событие никогда не происходило, и для которого не доступна никакая эффективная профилактическая мера

3 Средства измерения и оценки риска изменяются, так как широко захватывают различные профессии, и в действительности означают такие средства, которые могут определяться различными профессиями, например доктор управляет медицинским риском

4 Приемлемый риск представляет собой некоторый компромисс между уровнем безопасности и возможностями его достижения.

IX. Make up the dialogue

You meet your friend at the street. You are discussing nowadays risks and methods of avoiding these risks.

UNIT 6 THE KNOWLEDGE DILEMMA

Since the marginal cost of use of knowledge is nil, maximum efficiency in its use implies that there is no restriction to access and that the price of use is equal to zero. Knowledge should be a “free” good; that is the condition for optimum use of a nonrival good. There is no need to ration ideas by price since they already exist and cost nothing to replicate.

In this case, if charging for access excludes some would-be consumers, the result is waste. Wants go unsatisfied that could have been satisfied at no cost.

But whereas maximum efficiency in the use of knowledge supposes rapid and complete distribution and hence requires that its price be nil, the same does not apply to its production. Producing knowledge is costly, very much so in some cases. As a result, maximum efficiency in the use of resources to create new knowledge requires that the costs of all necessary resources be covered by the economic value of the knowledge created.

That is the dilemma: Only the anticipation of a positive price on use will guarantee the allocation of resources for creation, but only a price that is nil will guarantee efficient use of knowledge, once it has been produced. It is a dilemma between the social objective of ensuring efficient use of knowledge once it has been produced, and the objective of providing ideal motivation to the private producer. There is no simple solution to that problem. The answer will differ from case to case.

While any kind of knowledge and information is characterized by this dilemma, only the cumulative nature of knowledge makes this dilemma a serious issue. In this sense it is not possible to consider and treat in similar terms knowledge as a consumption good—or, in Fritz Machlup’s terminology, as “consumption capital”—and knowledge as an investment good likely to spawn new (knowledge) goods. The more knowledge is cumulative, the more wasteful is the effect of rationing it by price. In the field of scientific and technological knowledge, it is not only the individual enjoyment of a few consumers that is curbed by limiting the use of knowledge but, accumulation and collective progress are also limited—namely, the thousand opportunities afforded by new combinations between diverse elements of knowledge.

There is thus a danger of overgeneralization from both sides: on the one hand, in pursuing the public good analysis and deliberating on its welfare economic aspect, we are in danger of overgeneralizing a problem which is limited to scientific and technological knowledge (and even to a part of that domain). On the other hand, in seeking the best methods to support e-business—of, say, the entertainment sector— we are in danger of overgeneralizing methods such as Electronic Copyright Management Systems (ECMS) methods, that could generate huge social losses if applied to the part of the scientific and technological domain in which knowledge is highly cumulative.

Thus, by moving on from the property of externality to those of nonrivalry and cumulativeness, the contradiction worsens between the aim of increasing the private value of knowledge (implying restrictions on its use) and that of preserving its social value (implying free use). The more cumulative the use, the more control mechanisms—locks, tickets and patents—will tend to generate social losses. The dilemma imposes itself only with the notion of cumulativeness of knowledge which shifts it from the world of consumer goods to that of production.

The dilemma indicates that a positive externality, produced by a nonrival and cumulative good, cannot be corrected like a negative externality (or, more precisely, actions aimed at correcting a positive externality cannot be the exact opposite of those aimed at reducing a negative externality). In the case of negative externalities (noise, pollution) the problem is relatively simple: it is necessary to act on the source of the emission, either by demanding correction at the source or by taxing it. In the case of a positive externality the problem is not reducing it, because it is positive. The matter is more complex and the line is thin between the goal of protecting the creator’s interests and that of maintaining benefits for society. Another difference is that monitoring and preventing opportunistic behavior is likely to be much more difficult in the case of positive externalities. For instance, it is easy to provide “too much” subsidy, encouraging those with a small chance of finding the invention to engage in the search. It is hard to know “how much is too much”; such an invention may not exist, but if it did it would have very high social value.

VOCABULARY NOTES
a marginal cost - предельные издержки
to imply - подразумевать
restriction - ограничение

“free” good - свободное (бесплатное) благо
condition - условие
nonrival - неконкурентный
to ration - нормировать
would-be consumer - потенциальный потребитель
waste - отходы
unsatisfied - неудовлетворенный
a distribution - распределение
hence - следовательно
to require - требовать
costly - дорогостоящий
an anticipation - ожидание
an allocation - распределение
an ensuring - обеспечение
cumulative - совокупный
wasteful - расточительный
to curb - сдерживать
to support - поддерживать
pursuing - преследующий
to deliberate - обсуждать
the entertainment sector - индустрия развлечений
an externality - внешность
to worsen - ухудшаться
implying - подразумевающий
to impose - навязывать
pollution - загрязнение
an emission - излучение
an encouraging - поощрение

I. Suggest the Russian equivalents
1. “free” good
2. to ration ideas by price
3. charging for access
4. as a result
5. objective of providing ideal motivation
6. simple solution
7. from case to case
8. diverse element
9. the thousand opportunities
10. on the other hand
11. social value
12. consumer good

II. Replace the parts in italics by synonyms
1. *Since* the marginal cost of use
2. for optimum use of a *nonrival good*
3. cost nothing to *replicate*
4. Producing knowledge is *costly*
5. *any kind of* knowledge
6. *the cumulative* nature
7. an individual *enjoyment*
8. *to generate* social losses
9. on the source *of the emission*

III. Fill the gaps with the words and expressions/ ran the text
1. Maximum efficiency in its ___ implies that there is ___ to access and that the price of use is equal to ___.

2. Knowledge should be a ___ ___ .
3. Maximum efficiency in the use of knowledge ___ rapid and complete ___ .
4. Maximum efficiency in the use of resources to create new knowledge ____ that the costs of all necessary _____ be covered by the economic value of the _____ created.
5. Only the anticipation of a ___ price on use will guarantee the allocation of resources for creation, but only a price that is ____ will guarantee efficient use of knowledge.
6. There is no simple ___ to that problem.
7. It is not possible to consider and treat in similar terms knowledge as a _____ good.
8. In the field of scientific and technological knowledge, it is not only the _____ enjoyment of a few consumers that is curbed by ____ the use of knowledge.
9. We are in danger of overgeneralizing a ___ which is limited to scientific and technological knowledge.
10. The contradiction worsens between the ___ of increasing the private value of knowledge and that of preserving its social ___.
11. The dilemma imposes itself only with the notion of ____ of knowledge which shifts it from the world of consumer ____ to that of production.
12. In the case of a positive ____ the problem is not reducing it, because it is positive.
13. The ___ is more complex and the line is thin between the goal of protecting the creator's interests and that of maintaining ___ for society.
14. Another ___ is that monitoring and preventing opportunistic behavior is likely to be much more difficult in the case of positive ___.

IV. Find in the text English equivalents/ or the following

1. не существует никаких ограничений
2. цена на использование равна нулю
3. взимание платы за доступ
4. потенциальные потребители
5. необходимые ресурсы
6. эффективное использование знаний
7. по терминологии
8. в области научных и технических знаний
9. между различными элементами знаний
10. в поисках лучших методов
11. подразумевая бесплатное пользование
12. механизм контроля
13. оппортунистическое поведение
14. гораздо труднее
15. положительные внешние эффекты

V. Give explanations in English

1. a marginal cost
2. at no cost
3. maximum efficiency in the use of knowledge
4. a price that is nil
5. a social objective
6. a private producer
7. a consumption capital
8. an effect of rationing
9. e-business
10. a public good
11. the entertainment sector
12. negative externalities

VI. Answer the questions

1. How do you understand the marginal cost of use of knowledge?
2. Do you agree that there is no restriction to access the knowledge and the price of use is equal to zero? Why do you think so?

3. Does the producing knowledge costly very much in some cases? Why?
4. Whom does the dilemma of knowledge between?
5. What does this dilemma make a serious issue?
6. When does the effect of rationing by price be more wasterful?
7. What does the knowledge dilemma impose itself with?

VII. Translate using the active possible

1. Поскольку предельные издержки использования знаний равны нулю, из максимума эффективности их использования следует, что не существует никаких ограничений на доступ и что цена на использования равна нулю.
2. Знания должны быть "свободным" благом, что является условием для оптимального использования неконкурентных благ.
3. Нет необходимости нормировать понятие по цене, поскольку они уже существуют, и ничего не стоит повторить.
4. Производство знаний является дорогостоящим, и даже очень в некоторых случаях.
5. Хотя любой вид знаний и информации характеризуется этой дилеммы, только кумулятивный характер знаний делает эту дилемму серьезной проблемой.
6. Чем больше знаний накапливает, тем более расточительным является эффект нормирования его по цене.

VIII. Make up the dialogue

Two philosophers argue about the knowledge dilemma.

IX. Additional exercise

Tell us what in your opinion is consists the knowledge dilemma.

UNIT 7 THE CODIFIABILITY OF FACTUAL AND PROCEDURAL KNOWLEDGE

As far as factual knowledge is concerned, the successive inventions of paper, books and, the printing press were essential developments allowing the codification of this type of knowledge. Full codification was thus obtained very early in the historical process of the knowledge instrument's development.

Indeed, factual knowledge has a structure which makes its codification a relatively simple task. Later developments of knowledge instruments (e.g., the ability to store a large quantity of information on a CD-Rom) therefore improved the codifiability of factual knowledge only marginally.

However, the so-called electronic book represents a major breakthrough. The historian R. Chartier identifies the three lines of transformation that have constantly disrupted the economy of writing and the codification of factual knowledge:

• Transformations relative to material mediums: the scroll was followed by the codex, a book composed of folded, assembled, and bound pages. The creation of the book with a structure still used today constituted the basic starting point for a sequence of inventions relating to the quality of paper, the reduction in the size and importance of illuminations and, above all, the creation of analytical systems—foliation and indexing—making it easier to find one's way in a text. All this gradually turned the book into a knowledge instrument and opened the age of manuals.

• Transformations relative to the production of writing, from the manual copy workshop to the advent of printing and its mechanization.

• Transformations relative to the reader's relationship with the book:

Chartier notes that changes at the three levels have never really coincided in history. Very few inventions produced simultaneous changes at all three levels. It is in this sense that the electronic book is unique. It appears as a threefold revolution since it is causing an upheaval in the materiality of the text, its mode of production, and the reader's relationship with it.

The Codifiability of Procedural Knowledge The field of know-how and procedural-type knowledge is very different. The literary description of occupations, tricks of the trade, and expertise offers only very partial codification. In this field crucial technological changes were to occur only much later and, in most cases, still lie ahead of us. It is expert systems, based on the invention of new languages, models, and techniques, that greatly improve the codifiability of procedural know-how.

Moreover, this know-how comes in a whole range of different forms, from the artisan's know-how (consisting in the mobilization of a sum of known and memorized processes) to that of the repairer (which amounts to unravelling a mystery) and, finally, that of the strategist (consisting in defining a tactic by simultaneously reconstructing ends and means, depending on the circumstances).

Cowan has explored the codifiability of knowledge in those three cases:

• Planning and executing a linear process with a fixed goal is relatively easy to automate with an expert system. The steps of the process and the stages in planning it have simple interaction, with no feedback, to that "backward chaining" from the fixed goal through the various stages needed to reach it is feasible. Modern expert systems handle this task well. It is the fixity of the goal and the linearity of the process to achieve it that make this possible.

• Pattern recognition, categorization, and generalization are more difficult. The industrial processes in which these activities are most prominent lie in faulty diagnosis or repair. Expert systems developed for faulty diagnosis are moderately successful but have great difficulty when they encounter situations that are significantly different from those they have seen in the past. The difficulty here lies in the novelty of situations and in trying to draw analogies to other situations. What makes a repairer good is that he has internalized some of the logic of the system he is repairing and can use this in drawing the analogies he needs when faced with new situations. But this logic is highly abstract and difficult to codify. Current technology is still weak at drawing analogy, so it remains something at which human agents are better.

• Finally, there is activity which does not involve stable goals. In a sense, any firm's final goal is fixed, namely to maximize profit. But often the link between actions that can be taken immediately and the final goal of profit maximization is highly tenuous and difficult to discern. In this case, intermediate goals are put in place, to which the connection is closer. For instance, maximizing profits of a conglomerate is reduced to maximizing the profits of its subsidiaries.

The Codifiability of the "Know-Who" Type of Knowledge Finally, knowledge that allows access to other knowledge has remained largely uncodifiable for a long time. Address books or Yellow Pages are used to structure information without codifying the "know-how-to-find-information." It is

only with the development of artificial exploration agents operating on electronic networks that this type of complex knowledge becomes more efficiently codifiable. Its full codifiability is thus something of the distant future. The best agents would not only have to be efficient in finding all the information corresponding to a certain question, they would also have to take into account the peculiarities of the user and the situation. In this sense, an agent should fill the role of what some experts call a “digital sister-in-law”: when I want to go out to the movies, I ask my sister-in-law who is an expert on movies and an expert on me. Thus she will not inform me about the thousand movies showing this week in Paris but about the ten that she knows I would enjoy seeing.

Vocabulary notes

Factual Knowledge – знания, основанные на фактах;
Codifiability – возможность кодирования;
Concern – иметь отношение, касаться;
essential developments – неотъемлемые разработки;
relatively – относительно;
marginally – косвенно;
major breakthrough – главный прорыв;
disrupt – разрушать, разрывать;
material mediums – материальные средства;
scroll – свиток, манускрипт;
constitute – составлять;
sequence of inventions – ряд изобретений;
foliation and indexing – нумерация страниц и индексация;
manual – руководство, справочник;
advent – наступление, прибытие, приход;
coincide – совпадать, совмещаться;
simultaneous changes – одновременные изменения;
threefold revolution – тройная революция;
upheaval – подъем;
mode of production – способ производства;
Procedural Knowledge – процедурные знания;
tricks of the trade – специфические приёмы;
partial codification – частичная кодификация;
crucial – ключевой;
artisan – мастер, ремесленник;
repairer – мастер по ремонту, ремонтник;
simultaneously reconstructing – одновременно перестраивает;
circumstance – обстановка, среда;
interaction – взаимодействие;
feedback – обратная связь;
backward chaining – обратная цепочка рассуждений;
feasible – реальный, выполнимый;
Pattern – образец, модель;
Generalization – обобщение;
Prominent – заметны, видны;
Moderately – умеренно;
Encounter – встретиться, столкнуться;
Novelty – новизна;
Internalize – воспринимать, впитывать;
Current technology – потоковая технология;
stable goals – устойчивые цели;
tenuous – тонкий;
discern – разглядеть;
artificial exploration – искусственное исследование;
peculiarity – специфичность, особенность;

digital sister-in-law – невестка;

Assignments

I. Suggest the Russian equivalents

Full codification was obtained very early in the historical process;
Later developments of knowledge instruments improved the codifiability of factual knowledge;
Electronic book represents a major breakthrough;
It is expert systems, based on the invention of new languages, models, and techniques;
Planning and executing a linear process with a fixed goal;
Pattern recognition, categorization, and generalization are more difficult;
The industrial processes lie in faulty diagnosis or repair;
The difficulty lies in the novelty of situations and in trying to draw analogies to other situations;
Maximizing profits of a conglomerate is reduced to maximizing the profits of its subsidiaries.

*II. Replace the parts in **italics** by synonyms*

Factual knowledge has a structure which makes its codification a relatively (comparatively) *simple* (easy, elementary) task.
In this *field* (area) crucial technological changes were to *occur* (happen) only much later.
The difficulty here lies in the *novelty* (newness) of situations and in trying to draw analogies to other situations.
What makes a repairer good is that he has *internalized* (adopted) some of the logic of the system he is repairing.
But this logic is *highly* (extremely, greatly) abstract and difficult to codify.
She will not *inform* (report) me about the thousand movies showing this week in Paris.

III. Fill in the gaps -with the words and expressions/ran the text

1. But often the ____ between actions that can __ taken immediately and the final goal of profit maximization is highly tenuous and difficult __ discern.
2. The best agents would not only have __ be efficient __ finding all the information corresponding to a certain _____.
3. They would also have __ take into account the peculiarities __ the user and ___ situation.
4. When I want to go out __ the movies, I ask my sister-in-law who is an expert __ movies and an expert __ me.
5. Current technology is still weak __ drawing analogy, so it remains something at which human _____ are better.
6. Chartier notes that changes at ___ three levels have never really coincided __ history.
7. It is the fixity __ the goal and the linearity __ the process to achieve it that make ____ possible.
8. The literary description __ occupations, tricks __ the trade, and expertise offers only very _____ codification.
9. The scroll was followed __ the codex, a book composed __ folded, assembled, and bound _____.
10. It is expert systems, based __ the invention __ new languages, models, and techniques, that greatly improve the codifiability __ procedural know-how.
11. The successive inventions __ paper, books and, the printing press were essential developments allowing the codification __ this type __ knowledge.

IV. Find in the text English equivalents/or the following

электронные книги отображают главный прорыв; за свитком последовала рукописная книга; создание аналитических систем – нумерации и индексации; изменения на трёх уровнях никогда не совпадали; литературное описание занятий; ключевые технологические изменения; экспертные системы; от ремесленных знаний к знаниям мастеров; исполнение линейных процессов; неподвижность цели и линейность процесса; конечная цель фирмы зафиксирована; для максимизации прибыли.

V. Give explanations in English

Codification; factual knowledge; knowledge instruments; electronic book; foliation; indexing; procedural knowledge.

Find in the text English equivalents for the following

процедурный тип знаний; фактуальные знания; кодировка фактов; материальные средства; нумерации и индексации; специфические приемы; частичная кодировку; без обратной связи; простая цепочка рассуждений; распознавание модели; промышленные процессы.

VI. Answer the questions

1. What inventions did allow to codify factual knowledge?
2. What is the codex?
3. What the expert systems are based on?
4. What the expert systems are developed for?
5. What the term “digital sister-in-law” does mean?
6. What kind of the “Know-Who” Type of Knowledge do you know?

VII. Translate using all the active possible

1. Изобретение бумаги, книги и печати позволило кодифицировать знания, основанные на фактах.
2. В этой области ключевые технологические изменения произошли намного позже и, в большинстве случаев, до сих пор остаются недосягаемыми для нас.
3. Экспертные системы, которые основаны на изобретении новых языков, моделей и технологий, значительно улучшают возможность кодировки процедурных знаний.
4. Современные экспертные системы хорошо справляются с планированием и исполнением линейных процессов с зафиксированной целью.
5. Экспертная система информирует меня не о тысячах фильмах, которые показывают в эти выходные в Париже, а о тех десяти, которые меня могут заинтересовать.

IX. Make up the dialogue

Make up the dialog about what problem you want your expert system would solve.

X. Additional exercise

Write a composition about expert system, which would solve the problem you need.

UNIT 8 KNOWLEDGE AS A FACTOR OF PRODUCTION

In economic theory, the tendency is to consider any resource accumulated by an agent as some kind of capital. Following the informal style of sociology, we may speak of symbolic capital or relational capital. In the more formal field of economics, the 'credibility' of the government (concerning public policy) or the 'reputation' of a bank (concerning future interest rates) are considered as capital. Knowledge, in particular, is treated as a form of immaterial capital, as opposed to material capital. It is frequently incorporated into a concrete entity, such as material capital (computer program), an individual (skilled worker) or even an institution (organizational rules).

As with material capital, different forms of knowledge are considered. Firstly, knowledge may be declarative or procedural. Knowledge as a factor of production knowledge consists in rules followed by the external world ('to know that'). Procedural knowledge consists in rules modifying the external world ('to know how'). Secondly, knowledge can be explicit or implicit. Explicit knowledge is codified in a language and transmitted through that language. Implicit knowledge is incorporated in an informal way and is only transmitted by imitation and analogy. Thirdly, knowledge may be primary or secondary. Primary knowledge concerns the description of the agents global environment. Secondary knowledge deals with the rules necessary for treating the primary knowledge.

In order to study knowledge as capital, the former is distinguished in a more or less ambiguous way from information. In one definition, information is composed of elementary statements, while knowledge is a structured compound of several statements. This implies that information is declarative, whereas knowledge can be declarative or procedural. In a second definition, information is considered as a transient flow of exchange between two agents, while knowledge is a durable stock incorporated into a single agent. This implies that information is explicit, whereas knowledge can be explicit or implicit. These alternative definitions do not combine well together, since even structured knowledge can be transmitted from one agent to another.

In any case, when it is suciently codified and modular, knowledge can be treated as an exchangeable good. Explicit knowledge resembles sophisticated information, and is exchanged as such. Implicit knowledge can only be dealt with by considering the entity in which it is incorporated. On the production side, it is obtained at a higher cost than information, since it is the result of hard reasoning or long experience. Moreover, knowledge is generally more effective in producing
other goods than simple information is. On the consumption side, knowledge is consumed more efficiently than information, as it generates increasing returns: prior knowledge helps to build further knowledge. Even more, it generates externalities, since one agent can imitate another who possesses particular skills or farsightedness.

Despite certain special features, knowledge may then be bought and sold on a plain capital market. For instance, patents are bought and sold at a public price between inventors and users. The transaction's originality is that the patent is exchanged on a free market, but its content is protected from public use (inducing a monopoly). Likewise, a football player is transferred between two clubs for a certain price.

The transaction's originality is that the player can choose whether or not to accept the transaction and receives part of the price. However, an immaterial capital market remains far-removed from a competitive 142 7 Communication and reasoning in an economic system one, due to increasing returns and externalities. For this reason, many other institutions, such as property rights (royalty rules) or access rights (authorized football transfers), are involved in the transactions. Like any other capital, immaterial capital can be physically measured in two ways, relating either to its past production or future performance.

The past-related evaluation is the sum of all investments which have contributed to its constitution. The future-related evaluation is the sum of all future differential revenues it will induce. For an
individual, 'human capital' appears either as the past cost of education or as the future wages induced. For a firm, 'organizational capital' appears either as the past investments in training and design or as the future profits generated. Of course, these two values may differ in the absence of a market for capital, but they coincide when such a perfect market exists.

The employee is endowed with human capital obtained through prior training and past experience and gathered into 'capacities'. He is governed by a personal production function which links his capital and effort to the labor he effectuates. Generally, the capital he brings in or takes out is not priced when he enters or quits the firm. The employer possesses organizational capital represented

by the internal structure of the firm and gathered into 'competences'. He has relational capital formed of outside trade relations and gathered into 'reputations'. Moreover, material and immaterial forms of capital can be gathered into 'routines', i.e. programs able to achieve given tasks.

VOCABULARY NOTES

Informal style разговорная речь
symbolic capital symbolic capital символический капитал (по П. Бурдье: совокупность экономического, культурного и социального капиталов, накопленных субъектом и признаваемых легитимными (напр. репутация, внешность, имя, знаки достоинства, высокого социального статуса и т. п.))
field область
interest rates процентная ставка
skilled worker квалифицированный работник
external world внешний мир
Particular skills редкие навыки
Consumption side сторона потребителя
competitive конкурентоспособный
access rights права доступа
wage заработная плата

Assignments

I. Suggest the Russian equivalents

future wages induced; an immaterial capital market; between inventors and users; . Explicit knowledge is codified in a language; knowledge may be declarative or procedural; These alternative definitions; as the future profits generated.

*II. Replace the parts in **italics** by synonyms*

future *wages* induced; The *employee* is endowed with; On the *production* side; . Even more, it *generates* externalities; such as *property rights;* The *employer* possesses organizational capital represented.

III. Fill in the gaps -with the words and expressions/ran the text

1) The employee is _____ with human capital obtained through prior training and past _____ and gathered into 'capacities'
2) *Moreover, _____ and immaterial _____ of capital can be gathered into 'routines', i.e. programs able to achieve given tasks.*
3) Following the _____ style of sociology, we may speak of _____ capital or _____ capital.
4) . For an individual, 'human capital' appears either as the past cost of education or as the future _____ induced
5) _____ resembles sophisticated information, and is exchanged as such
6) However, __ immaterial capital market remains far-removed from a competitive
7) knowledge can be treated as an exchangeable _____.
8) Like any other capital, _____ capital can be physically measured in ___ ways, relating either to its past production or future performance
9) Generally, the capital he brings in or _____ ____is not priced when he enters or quits the firm
10) It is frequently incorporated into a concrete entity, _____ __ material capital (computer program), an individual (skilled worker) or even __ institution
11) either as the past investments __ training and design or as the _____ profits generated
12) On the _____ side, knowledge is consumed more
13) who possesses _____ skills or farsightedness.
14) This _____ that information is declarative, whereas knowledge can __ declarative or procedural

IV. Find in the text English equivalents/or the following

Более важная помощь; материальный и нематериальный капитал; рынок; знания могут быть доступными или недоступными, первичными или вторичными; кратковременный поток обмена данными между факторами, будущий дифференциальный подход.

V. Give explanations in English

Material capital; implicit knowledge; external world; informal way; transaction's originality.

VI.*Find in the text English equivalents for the following*

Отсутствие рынка для капитала; внутренняя структура фирмы; общепринятая практика; между изобретателем и пользователем.

VII. Answer the questions

1. What tendency do you know in economic theory?
2. What is considered to be as capital?
3. What kinds of knowledge do you know?
4. What's information?
5. What special features of knowledge do you know?
6. What is the different between past-related and future-related evolutions?
7. When they can coincide?
8. With what the employee endowed?

VIII. Translate using all the active possible

1) Несмотря на определенные особенности знаний, она могут покупаться и продаваться на определенных рынках капитала
2) Он управляется через персональную производственную функцию, которая связывает капитал и усилия совершаемого труда.
3) Знания, в частности, это очищенная форма нематериального капитала.

IX. Make up the dialogue

Try to explain your partner, why knowledge is treated as a form of immaterial capital.

X. Additional exercise

Write a letter about all factors of production.

UNIT 9 COORDINATION MODEL OF KNOWLEDGE PRODUCTION

The expanding role of science in the innovation process, and the increasing contribution of users to the improvement of product and service design, are significant trends making the system of knowledge production more complex and more widely distributed.

A further element of complexity relates to the evolution of products. New products are rarely stand-alone items; they are more often components of broader systems or structures. In modern technology, modularity is an objective that increasing numbers of firms are pursuing in order to benefit from the specialized division of labor and to create proper conditions for innovation. Modularity is both a solution to growing complexity and a method for innovation management. Module designers are free to try out a wide range of approaches as long as they obey the design rules ensuring that the models .t together (Baldwin and Clark 1997). The definition of specifications for the interfaces and organization of integration are thus becoming an essential aspect of product development as well as providing opportunities for creating specific types of knowledge. A significant share of knowledge generation occurs in the process of interface design and system integration.

"Integrative Knowledge". The appearance of increasingly complex coordination problems affords an opportunity to produce "integrative knowledge," that is, norms, standards, infratechnologies, and common product development platforms. Integrative knowledge is used temporarily to guarantee compatibility, interoperability, and interconnectivity between subsystems and modules. It is thus at the base of new forms of division of work, allowing the exploitation of network externalities and creating a new regime of variety of goods. The consumer can combine different modules to obtain a singular good.

Another Rationale for Collaboration in Knowledge Production

It follows that the increasing importance of collaboration in knowledge production cannot be explained only by the usual rationales provided by the economics of R&D. When integration is the issue, a possible rationale for collaboration concerns the need for reducing uncertainties and ambiguities in modular technologies and loosely coupled systems.

This is a usual rationale in sectors such as automobiles, other transport technologies, and jet engines. The traditional solution relied on vertical integration, but this practice has now been revised in favor of outsourcing and collaboration, requiring strong coordination mechanisms.

The Covisint venture, for instance, involving many car companies (DaimlerChrysler, Ford, GM, Renault, Nissan) supports cooperation in engineering and system design with a view to standardizing parts, as well as supply chain management and procurement functions. Another rationale for "integration-oriented collaboration" relates to the strategy of forming a tribe and building a coalition to create a standard.

Three Models of Innovation in the Knowledge Economy

• The first major trend concerns the increasingly scientific nature of research methods. In more and more sectors, the "epistemic culture" of science for knowledge production is growing in.

• Users' increasingly marked engagement in knowledge production represents a second trend.

• Finally, the increasing complexity and modularity of industrial architecture make it more critical than ever to produce "integrative knowledge," such as standards, norms, common architectures, and platforms.

Yet these ideal types are rarely identifiable in a pure form. They are born at certain points in history, in specific limited domains. Their importance grows as they combine and hybrids are formed. Many "real" innovation processes are the result of combinations between the different models already described.

I am thinking particularly of the combination between model 1 and model 2, that is, innovations based both on science and on users' (or laypersons') knowledge. This category of innovation has been analyzed in depth by Callon (1999). The crucial factor is the participation of "layexperts" in the production (and use) of scientific knowledge.

Some areas, in which laypersons unquestionably possess knowledge of use to scientific investigation, are particularly well-suited to this type of innovation. The perfect example is health. The environment can also afford opportunities for close collaboration between layexperts and scientists.

The combination between model 1 and model 3 corresponds to innovation resulting from a technological break, based both on scientific progress and the ability to solve coordination problems posed by complex technological systems. The archetype here is innovation in transport technologies

Finally, a last trend has been highlighted, concerning the increasing role of collaboration, not only

for basic research purposes but also for solving increasingly complex problems raised by design and integration. Such coproduction of knowledge may take various forms beyond basic research consortia, from establishing a strong relationship between a supplier and user to creating a complex set of coproducers based on the modularity of the product or to cooperatively establishing a technical standard.

Vocabulary notes

contribution – взнос, вклад;
relate to – иметь отношение, касаться;
stand-alone items – отдельные наименования;
modularity – модульность;
pursue – преследовать, гнаться;
free to try out – свободны в экспериментировании;
obey – подчиняться, удовлетворять условиям;
ensure – гарантировать, обеспечивать;
essential aspect – неотъемлемый аспект;
to guarantee compatibility, interoperability, and interconnectivity – гарантировать сочетаемость, функциональную совместимость и взаимную связность;
singular good – идеальный товар;
collaboration – сотрудничество;
rationale – логическое обоснование;
R&D – НИОКР;
reducing uncertainties and ambiguities – сокращение неточностей и неопределенностей;
loosely coupled systems – нежесткие парные системы;
jet engines – реактивные двигатели;
revised in favor of – исправлена в пользу;
supply chain management – управление поставщиками;
procurement function – функция закупки;
strategy of forming a tribe – стратегия формирования компании;
epistemic culture – познавательная культура;
marked engagement – отмеченное участие;
layexperts – непрофессионалы;
possess knowledge – обладать знаниями;
well-suited – хорошо подходящий;
highlight – освещать.

Assignments

I. Suggest the Russian equivalents
components of broader systems or structures;
importance of collaboration in knowledge production;
increasingly scientific nature of research methods;
the increasing complexity and modularity of industrial architecture;
these ideal types are rarely identifiable in a pure form;
combinations between the different models already described;
laypersons unquestionably possess knowledge;
the ability to solve coordination problems posed by complex technological systems;
solving increasingly complex problems raised by design and integration.

*II. Replace the parts in **italics** by synonyms*
The *expanding* (enlarging) role of science in the innovation process;
significant (important) trends making the system of knowledge production more complex and more widely distributed;
New products are rarely stand-alone *items* (articles);
increasing *importance* (significance) of collaboration in knowledge production cannot be explained;

collaboration (co-operation) in knowledge production;
The Covisint *venture* (enterprise), for instance, involving many car companies.

III. Fill in the gaps -with the words and expressions/ran the text

1. The _____ of specifications for the interfaces and organization of integration are thus becoming an essential aspect of _____ development
2. A significant _____ of knowledge generation occurs in the _____ of interface design and system integration.
3. The consumer can _____ different modules to obtain a singular ____.
4. It follows that the increasing importance of collaboration in knowledge _____ cannot be explained only __ the usual rationales provided by the economics of R&D
5. This is a usual rationale in sectors ____ as automobiles, other transport technologies, and ___ engines.
6. In more and ____ sectors, the “epistemic culture” of _____ for knowledge production is growing in.
7. Yet these ideal _____ are rarely identifiable in a ____ form.
8. Their importance grows __ they combine and hybrids are formed.
9. This _____ of innovation has been analyzed in _____ by Callon (1999).
10. The crucial _____ is the participation of “layexperts” in the _____ (and use) of scientific knowledge.
11. Finally, a last trend has been _____, concerning the increasing ____ of collaboration.
12. Such _____ of knowledge may take various _____ beyond basic research consortia.

.

IV. Find in the text English equivalents/or the following

роль науки в инновационном процессе; вклады пользователей в усовершенствование разработки продуктов и услуг; определение технических условий для …; в процессе разработки интерфейса и систем интеграции; потребитель может комбинировать разные модули; исключительный продукт; значение сотрудничества в производстве знаний; транспортные технологии и реактивные двигатели; с целью стандартизации частей; управление поставками и закупками; «познавательная культура» науки; модульность промышленной архитектуры; решающий фактор; комплексные технологические системы; вдали от простых исследовательских консорциумов.

V. Give explanations in English

innovation process; modularity; compatibility; interoperability; interconnectivity; singular good; supply chain management; layexperts.

VI. Find in the text English equivalents for the following

Комбинация моделей; технологический брак; логическое обоснование; технические условия; модульность; подсистемы; модули; генерация знаний; неопределенность; кооперацию в проектировке.

VII. Answer the questions

1. What is “layexpert”?
2. Which three models of innovation in the knowledge economy do you know?
3. What kinds of integrative knowledge do you know?
4. What acronym R&D is mean?
5. What the term “outsourcing” is mean?
6. For what the integrative knowledge is used?

VIII. Translate using all the active possible

1. Предприятие поддерживает кооперацию в проектировке и разработке продукта с целью стандартизации составных частей продукта.
2. Появляющиеся на рынке товары – это редко автономные наименования, чаще они являются компонентами более сложной системы или структуры.
3. Определение технических условий при разработке продукта является неотъемлемым элементом его разработки.
4. Интеграционные знания используются временно с целью гарантии сочетаемости,

функциональной совместимости и взаимной связности между подсистемами и модулями одной сложной структуры или системы.
5. В некоторых областях непрофессионалы, либо любители, обладают необходимыми знаниями для проведения научных исследований.

IX. Make up the dialogue

You want to expand your business. For that you need to consult an expert about “outsourcing”.

X. Additional exercise

Write a composition about forms of collaboration in manufacturing.

UNIT 10 KNOWLEDGE SPILLOVERS AND THE GEOGRAPHY OF INNOVATION

The notion of “localized spillovers” has another meaning which is related to geographical space and the role of “real” distances, namely, the ability to absorb knowledge spillovers is influenced by the distance from the knowledge source. Thus, geography matters in two senses:

1. Marginal costs of reproduction and transmission of knowledge are sufficiently high to create a space in which distance and proximity play an important role in shaping knowledge and information spillovers. There is therefore a law of decreasing importance of spillovers, in direct relation to increasing geographical distance;

2. Collocation of people engaged in a collective process of intellectual creation has its own merits when it comes to knowledge exchange.

Table Key Characteristics of Collocated Synchronous Interactions

Characteristics	Description	Implications
Rapid feedback	As interaction flow, feedback is as rapid as it can be	Quick corrections possible when there are noticed misunderstandings or disagreements
Multiple channels	Information among participants flows in many channels - voice, facial expressions, gesture, body posture, and so on.	There are many ways to convey a subtle or complex message; also provides redundancy
Personal information	The identity of contributors to conversation is usually known	The characteristics of the source can be taken into account
Nuanced information	the kind of information that flows is often analog or continuous, with many subtle dimensions	Very small differences in meaning can be conveyed; information can easily be modulated
Shared local context	Participants have a similar situation (time of day, local events)	A shared frame on the activites; allows for easy socializing as well as mutual understanding about what's on each others' minds
Informal "hall" time before and after	Impromptu interactions take place among subsets of participants upon arrival and departure	Opportunistic information exchanges take place, and important social bonding occurs
Coreference	Ease of establishing joint reference to objects	Gaze and gesture can easily identify the referent of deictic terms
Individual control	Each participant can freely choose what to attend to	Flexible monitoring of how all of the participants are reacting to whatever is going on
Implicit cues	A variety of cues as to what is going on are available in the periphery	Natural operations of human attention provide access to important contextual information
Spatiality of refence	People and work objects are located in space	Both people and ideas can be referred to spatially

In view of these merits, face-to-face contact and real meetings have an unquestionable advantage in the field of knowledge exchange and collective intellectual creation.

Thus, spatial clusters of activities are at least partially explained by the advantage of proximity and the necessity of collocation in the process of knowledge creation. The fact that geography matters in explaining the importance of spillovers is therefore undisputable. This argument must, however, be qualified in three respects:

1. First, many other factors play a role in explaining the formation of geographical clusters of activities. The mere fact that the concentration of physical activities may generate large private and social returns (owing to economies of scale and indivisibilities in physical infrastructures) is an important factor. Purely political factors are also important. Some cases of clusters of activities have very little to do with spatial effects. For instance, Leslie and Kargon contrasted the Princeton cluster of scientific activities (involving Washington, DC, and Los Alamos, which is a pure political cluster based on an “imaginary geography”) and the Stanford cluster, in which the local environment matters a lot.

2. Second, the potential of ICT to reduce spatial and proximity constraints has to be seriously considered.

3. Finally, proximity in itself is irrelevant. It is the way in which professional communities use it

to combine their tangible and intangible assets that counts. Depending on the dynamic created, proximity remains a purely geographical phenomenon or becomes an effective organizational structure (combining incentives and coordination) for knowledge creation. Thus, Silicon Valley is not only a territory, it is above all “A set of collaborative practices that blur the boundaries between local firms, and between firms and local educational and financial institutions”.

VOCABULARY NOTES
knowledge spillovers - распространение знаний
“localized spillovers” - "Локализованные внешние эффекты"
to relate - связывать
the ability - способность
sufficiently high - достаточно велик
a proximity – близость (расстояние)
there is therefore - существует, следовательно,…
decrease - снижение
a collocation - размещение, расположение
an unquestionable advantage - несомненное преимущество
undisputable - неоспоримый
merit - достоинство
participant - участник
facial expression - мимика
gesture - жесты
to convey - передать
subtle - тонкий
redundancy - избыточность
a socializing - общение
cluster - направление, концентрация
mere - простой, явный
“imaginary geography” - мнимая география
to reduce - по сокращению, сокращать
irrelevant - не относящийся к делу
to combine - объединить
tangible - материальный
to remain - оставаться

I. Suggest the Russian equivalents
geography matters;
marginal costs of reproduction;
a law of decreasing importance of spillovers
joint reference
face-to-face
spatial clusters of activities
advantage of proximity
in explaining the formation of
as rapid as it can be
natural operations

II. Replace the parts in italics by synonyms
has another *meaning*;
transmission of knowledge;
to shape knowledge
to have its own *merits*
for instance
based on
tangible and *intangible*
take into account

for easy *socializing*

III. Fill the gaps with the words and expressions/ ran the text

Marginal ___of reproduction and transmission of knowledge are sufficiently high to create a space in which ___ and ___ play an important role in ___ knowledge and information spillovers.
The identity of ____ to conversation is usually known.
This is the kind of information that flows is often ___ or ____, with many subtle __.
Very small differences in meaning can be ___.
It allows for easy socializing as well as ___ understanding about what's on each others' ____.
Coreference characterized ___ of establishing joint reference to objects.
___ and ___ can easily identify the referent of deictic terms.
Each _____ can freely choose what he should to attend to.
Flexible monitoring of how all of the participants are ____ to whatever is ____.
Natural operations of ___ ____ provide access to important contextual information.
Spatial clusters of ___ are at least partially explained by the advantage of ___ and the necessity of ___ in the process of ___ creation.
The fact that geography ___ in explaining the importance of ___ is therefore undisputable.
It is the way in which professional communities _____ combine their ___ and assets that counts.
As interaction flow, feedback is as rapid as ___.

IV. Find in the text English equivalents/ or the following

понятие "локализованных внешних эффектов";
связано с географическим пространством;
расстояния от источника знаний;
предельные издержки воспроизводства;
в непосредственной связи с увеличением географической удаленности;
занятые в процессе коллективного интеллектуального творчества;
с учетом этих достоинств;
география инноваций;
пространственная близость и ограничения;
ч.-л. должно быть серьезно рассмотрено;
с учетом этих достоинств;
небольшая разница;
тонкие размеры;
время до и после;
экспромт взаимодействия;
между подгруппами участников;
социальные связи;
ссылки на объекты.

V. Give explanations in English

“localized spillovers”
geographical space
a knowledge source
opportunistic information exchange
geography matters
a collective process
a law of decreasing importance of spillovers
face-to-face contact
spatial effects
multiple channels

VI. Answer the questions

What are the localized spillovers?
The ability to absorb knowledge spillovers is influenced by the distance from the knowledge source.
Do you agree with the author?
How many senses have geography matters? What are they?

What is the law of decreasing importance of spillovers?
Do real meetings have an unquestionable advantage in the field of knowledge exchange? And why?
What do the three respects of geography matters in explaining the importance of spillovers?
What does the concentration of physical activities may generate?
How do you think is it important in geographical clusters of activities?
In your opinion, is it necessary to pay attention on the potential of ICT?

VII. Translate using the active possible

Предельные издержки воспроизводства и передачи знаний, достаточно велики, чтобы создать пространство, в котором расстояния и близости играют важную роль в формировании знаний и информации о внешних эффектах.
Факт, что вопросы географии, в объяснении важности внешних эффектов считаются неоспоримыми.
Таким образом, пространственное направление деятельности, по крайней мере частично объясняется преимуществами географической близости и необходимости размещения в процессе формирования знаний
Некоторые случаи направлений деятельности имеют мало общего с пространственными эффектами.
И наконец, близость сама по себе не имеет значения.

VIII. Make up the dialogue

You got a new job in a science company. Ask the manager to tell you about your responsibilities.

IX. Additional exercise

Write the actual essay about knowledge spillovers.

UNIT 11 THE EMERGENCE OF INTELLECTUAL CAPITAL

The third millennium society has workers who are valuable because of what they know. In many such enterprises the value is not in the tangible assets, but in the intangible ones. Intellectual capital is the term given to the combined intangible assets which enable the company to function efficiently. It is the knowledge of a workforce; the training and intuition of a team of chemists who discover a billion-dollar new drug or the know-how of workmen who come up with a thousand different ways to improve the efficiency of a factory. It is the electronic network that transports information at light speed through a company, so that it can react to the market faster than its rivals. It is the collaboration, the shared learning between a company and its customers, which forges a bond between them that brings the customer back again and again. It is collective brainpower. It's hard to identify and harder still to deploy efficiently. But once you find it and exploit it, you win.

The components of intellectual capital are:

- **Market assets** are those which are derived from a company's beneficial relationship with its market and customers. Market assets are the potential an organization has due to market related intangible assets. Examples include: customers and their loyalty, distribution channels, various contracts and agreements and so on.
- **Intellectual property assets** include know-how, trade secrets, copyright patents and various design rights. Intellectual property represents the legal mechanism for protecting many corporate assets.
- **Human-centered assets** comprise the creative and problem-solving capability, leadership, entrepreneurial and managerial skills embodied by the employees of the organization. We are not looking at an individual in order to perform a particular job function, but view the individual as a dynamic entity who may fit into a variety of jobs over time. As they become proficient and then excel in their activities, people learn more and become more valuable.
- **Infrastructure assets** are those technologies, methodologies and processes which enable an organization to function efficiently on the long run. Examples include: organization culture, methods of management, financial structure, databases and information on the market or customers, communication systems such as e-mail and modern teleconferences systems.

One hundred years ago, labor was cheap. In the third millennium labor is not cheap. The human-centered assets a company needs to operate will be rare and expensive. It will take years of investment to create valuable market infrastructure and intellectual property assets. The emerging importance of intellectual capital reflects the organization's increasing dependence on intangible assets. New types of companies, which have only intangible assets, are born every day. Their products are intangible and can be distributed electronically in the "virtual market space" via Internet. Such media and knowledge intensive organizations whose products are digital are third millennium enterprises. The world has changed again and we must find new ways of monitoring and managing the organization which reflect those changes. The third millennium workforce is a knowledge-based workforce. The workforce is participatory, understanding the goals of the company and receiving satisfaction from knowing the part they play in achieving them.

In the third millennium the organization in Romania must put emphasis on encouraging employees' involvement, showing an appreciation for individuals' contribution in the organization. There are many ways in which to think about people when trying to assess their value, both current and potential to the organization. Different modern forms of investment in education are mostly recommended: training, vocational qualifications, work related to knowledge, work related competencies As the work-force becomes more "global", valuable employers and employees invest more and more in themselves. This may protect and grow core competencies. Knowledge analysts are required to work with individuals in the organization to identify key knowledge assets. In order to increase people power, it is necessary to measure human-centered assets. Knowledge means power and profits. Every country, company and individual depends increasingly on knowledge-patents, processes, skills, technologies, information about customers and suppliers. Even Pope John Paul II recognized the growing importance of "know-how, technology and skill" in his 1991 encyclical "Centesimo Annus", writing: "Whereas at one time the decisive factor of production was the land, and later capital…today the decisive factor is increasingly man himself, that is, his knowledge."

The extension of the intellectual capital asset base can be achieved in the third millennium enterprise if creativity and innovation abound everywhere in the company. There is a feeling of success and of constant movement and change.

The real "heroes" of an organization are those who excel and help the company win and grow on

the long run. This means also to create a corporate culture which promotes and supports the process of innovation. There is a direct relationship between how innovative a company is and its ability to expand intellectual capital. The degree to which a company is innovative is a measure of its life force.

VOCABULARY NOTES:

Tangible assets – материальные активы;

Intangible assets – нематериальные активы;

Enable the company to function efficiently – позволит компании эффективно функционировать;

Rivals – соперники;

The shared learning – совместное обучение;

Entrepreneurial and managerial skills – предпринимательские и управленческие навыки;

Dynamic entity – динамический объект;

To become proficient – становиться опытнее;

Must put emphasis on encouraging employees' involvement – должны делать упор на поощрение участия сотрудников;

The extension of the intellectual capital asset base – расширение интеллектуального базового актива.

I. Suggest the Russian equivalents

The third millennium society; , trade secrets; copyright patents and various design rights; Intellectual property represents the legal mechanism for protecting many corporate assets; Human-centered assets; entrepreneurial and managerial skills; methods of management; databases and information on the market or customers; of investment; virtual market space.

*II. Replace the parts in **italics** by synonyms*

Exertion was cheap; *up-to-date* types of companies; new *methods* of monitoring; the organization which *reveal* those changes; *various* modern forms of investment; the *enlargement* of the intellectual capital asset base; a billion-dollar new *medicine*.

III. Fill in the gaps -with the words and expressions from the text

1. The third __ society has __ who are valuable because of what they know.
2. It is the electronic __ that transports information at light __ through a company, so that it can react to the market faster than its __.
3. It is collective __.
4. It's hard to identify and harder still to deploy __.
5. Market __ are those which are derived from a company's beneficial relationship with its market and __.
6. One hundred __ ago, labor was __.
7. The __-centered assets a company needs to operate will be rare and expensive.
8. The emerging importance of __ capital reflects the organization's increasing dependence on intangible assets.
9. New __ of companies, which have only intangible assets, are born every day.
10. Their products are intangible and can be distributed electronically in the "virtual __ space" __ Internet.
11. The world has __ again and we must find new ways of monitoring and managing the organization which reflect those changes.
12. The third millennium workforce is a __-based workforce.
13. The real "heroes" of an __ are those who excel and help the __ win and grow on the long run.
14. This means also to create a __ culture which promotes and supports the __ of innovation.
15. There is a direct relationship between how innovative a company is and its ability to expand __ capital.
16. The degree to which a __ is innovative is a measure of its life force.

IV. Find in the text English equivalents/or the following

Общество третьего тысячелетия; интеллектуальный капитал; материальные активы; нематериальные активы; повышать эффективность завода; электронная сеть; передавать информацию; рыночные активы; сотрудничество; полезные компании отношения; различные

контракты и соглашения; новые типы компаний, сила, основанная на знаниях работников.

V. Give explanations in English

Intellectual capital; a billion-dollar new drug; the electronic network that transports information at light speed through a company; it can react to the market faster than its rivals; collaboration; shared learning; customers; to deploy efficiently; entrepreneurial and managerial skills; the tangible assets; the intangible assets.

VI. Answer the questions

1. What is the tangible assets?
2. What is the intangible assets?
3. What are the components of intellectual capital?
4. What are the examples of market assets?
5. What are the examples of intellectual property assets?
6. What are the examples of human-centered assets?
7. What are the examples of infrastructure assets?
8. Who are the real ‘heroes’ of an organization?

VII. Translate using all the active possible

1. В третьем тысячелетии рабочие ценятся за свои знания.
2. Электронные сети, которые позволяют передавать информацию через компанию со скоростью света, обеспечивают более быстрое реагирование компании, по сравнению с конкурентами, на изменения на рынке.
3. Сотни лет назад труд был дешевым;
4. Мир снова изменился, и мы должны найти новые способы контроля и управления организацией.

VIII. Make up the dialogue

You are introducing a new type of fuel and are talking to a business consultant, about it.

IX. Additional exercise

Write a letter of interest.

UNIT 12 THE ADVENT OF INTELLIGENT MODELS

Business process modeling is often *a no-win situation*. And even where the fusion of working knowledge and abstract representation is successful, its result is too often thwarted by the *unpredictable dynamics* of the real world. In fact, as Figure I.1 illustrates the *direct relation* between the development of *global economy* in time and the *rate of its change* (pressure on business). In the beginning of the 20th century the Manufacturing Economy with a low rate of change occurred, it was changed by the Service Economy with the moderate pressure on business. In the end of the century Knowledge Economy with the high rate of change took place and in the future it will give place to the Shared Intelligence Economy, which will ***exert*** *very high pressure on the business*. Our entire world has become connected through *a freely available and highly diverse information network*, revolutionizing the way we communicate, *conduct business*, and perform scientific and business research. At the same time, the network suffers from *increasing amounts of noise,* bandwidth saturation, and criminal activity.

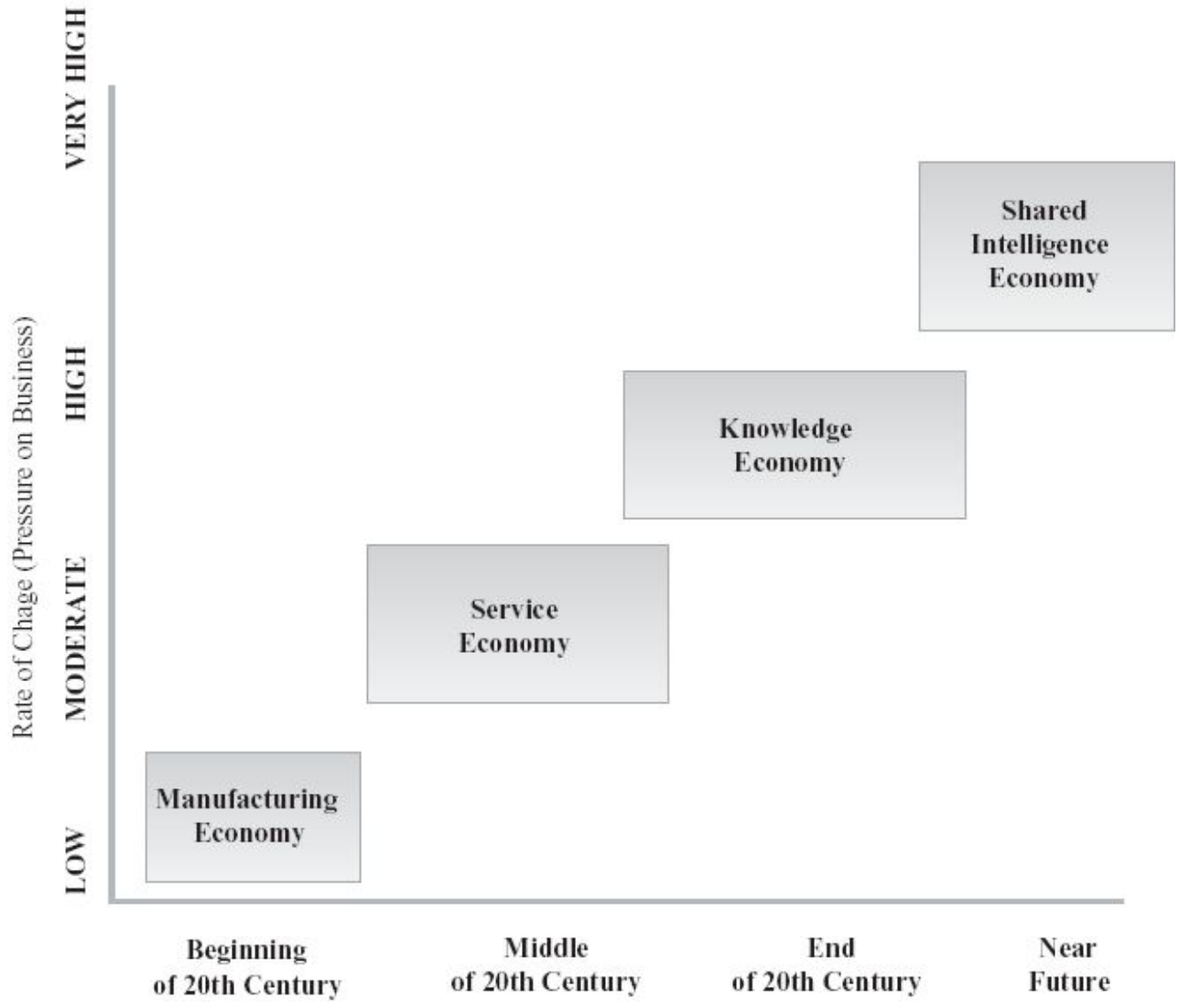


Figure I.1 Rates and types of changes in the global economy.

As a result of these uncertainties, *business-forecasting models* have **fallen out of favor** in recent years. Instead, business planners tend to concentrate on the *short-term analytical* ***approach*** to business forecasting. In particular, intelligent models - known in the 1970s as *decision support systems* and later as expert systems (although they use different technologies) - have been replaced by the *ubiquitous spreadsheet*. Yet spreadsheets **are no substitute** for knowledge-based models in such critical areas as *risk assessment, econometric modeling, new product positioning*, *customer profiling, cross marketing, sales forecasting, and impact analysis*. There are some new types of intelligent models that *incorporate* ***fuzzy*** *measures* as well as evolutionary or genetic techniques. These technologies provide ways to make your models more **responsive** to changes in demographics and the economy. A less obvious solution to the problem of change and uncertainty is simply to incorporate these factors into the model itself. We must create our models so that they automatically change their *internal behavior structure* to accommodate changes in the outside world. One approach to this is the *adaptive model* - a model that alters its rules based on changes in the outside world. A powerful and robust way of building an adaptive model involves the combination of three broad technologies: *fuzzy logic*, knowledge discovery, and *genetic algorithms*. Fuzzy logic provides a method for capturing the semantics or meaning of the data through a collection of *fuzzy* ***sets*** associated with each variable. Knowledge discovery (or *data*

mining) uses these fuzzy sets to generate an initial model of *if-then rules*. A genetic algorithm creates and tests many candidate models by changing the model parameters (such as the number of variables or the fuzzy sets underlying the **variables**) until it finds the configuration that performs the best.

VOCABULARY NOTES

no-win situation - безнадёжное, безвыходное положение
unpredictable dynamics - непредсказуемая, непрогнозируемая динамика
direct relation - прямая зависимость
global economy - мировая экономика
rate of change - скорость изменения, темпы изменений роста
exert high pressure on the business – оказывать сильное воздействие (давление) на бизнес
freely available and highly diverse information network – легко доступные весьма разнообразные информационные сети
conduct business – управление бизнесом
increasing amounts of noise - возрастающий уровень помех, шума
business-forecasting models - модели прогнозирование конъюнктуры, модели бизнес прогнозирования
short-term analytical approach - краткосрочный аналитический метод
decision support systems - системы поддержки принятия решений
ubiquitous spreadsheet – повсеместная крупноформатная таблица (электронная таблица)
risk assessment - оценка рисков
econometric modeling – эконометрическое моделирование
new product positioning – позиционирование нового товара
customer profiling - профиль клиента
cross marketing - кроссированный [перекрещенный] рынок
sales forecasting - прогнозирование сбыта (продаж)
impact analysis - анализ воздействия
incorporate fuzzy measures - объединять нечёткие критерии
internal behavior structure – внутренняя структура поведения
adaptive model - адаптивная модель
genetic algorithms - генетические алгоритмы
fuzzy logic - нечёткая логика
fuzzy sets - нечёткие множества
if-then rules - правила поиска решений
data mining - извлечение информации, вскрытие данных

Assignments

I. Suggest the Russian equivalents

Business process modeling; revolutionizing the way we communicate; to make model more responsive to changes; to incorporate factors into the model; business forecasting; candidate models; critical areas; configuration that performs the best.

*II. Replace the parts in **italics** by synonyms*

Economy, which will *influences* very high pressure on the business; business-forecasting models *haven't been used* in recent years; spreadsheets *can't replace* knowledge-based models; incorporate *uncertain* measures; the short-term analytical *method*; a collection of fuzzy *multitude* associated with each variable; the fuzzy sets underlying the *inconstants*

III. Fill in the gaps -with the words and expressions/ran the text

1. Business process ___ is often a ___ situation
2. In the beginning of the 20th century the Manufacturing Economy with a ___ rate of change occurred, it was changed by the ___ Economy with the moderate pressure on business.
3. At the same time, the network suffers from ___ amounts of noise, bandwidth ___, and criminal

___.

4. ___- forecasting models have fallen out of ___ in recent years.

5. Knowledge discovery (or ___mining) uses these ___ sets to generate an initial model of if-then ___.

6. Yet spreadsheets are no substitute for knowledge-based models in such ___areas as ___ assessment, econometric ___, new product positioning, ___ profiling, cross ___, sales forecasting, and ___ analysis.

7. We must create our models so that they automatically change their ___ ___ structure to accommodate changes in the outside world.

8. One approach to this is the ___ - a model that alters its rules based on changes in the outside world.

9. Fuzzy ___ provides a method for capturing the semantics or meaning of the data through a collection of fuzzy ___ associated with each variable.

10. A powerful and robust way of building an adaptive model involves the combination of three broad technologies: ___ logic, knowledge discovery, and ___.

11. Our entire world has become connected through a freely ___ and highly diverse information ___.

12. Instead, business planners tend to concentrate on the s___-term analytical approach to business forecasting.

13. There are some new types of intelligent models that incorporate ___ measures as well as evolutionary or genetic techniques.

IV. Find in the text English equivalents/or the following

скорость изменения; оценка рисков; нечёткие множества; анализ воздействия; краткосрочный аналитический метод; системы поддержки принятия решений; правила поиска решений; информационные сети; бизнес прогнозирование; экспертная система; параметры модели; совершение научных и бизнес исследований; менее очевидное решение проблемы; обнаружение (выявление) знаний

V. Give explanations in English

unpredictable dynamics; rate of change; moderate pressure; sales forecasting; short-term analytical approach; fuzzy sets; critical areas; to alter the rules; evolutionary technique; thwart by.

VI. Read the description of drawing a circular/low

There are two cross lines. The horizontal line is divided into four equal pieces. Here are they (from the left to the right): "beginning of the 20th century", "middle of the 20th century", " end of the 20th century", "near future". The vertical line indicates the rate of change and it is divided into four equal pieces. Here are they (from the bottom to the top): "low", "moderate", "high", "very high". Fill the matrix.

On the crossing of the leftmost horizontal segment ("beginning of the 20th century") and the lowermost vertical segment ("low") there is a square "Manufacturing Economy". More to the right and little above, on the crossing of the second horizontal segment ("middle of the 20th century") and the second vertical segment ("moderate") there is a square "Service Economy". Continue moving through the main diagonal, on the crossing of the third horizontal segment ("end of the 20th century") and the second third vertical segment ("high") there is a square "Knowledge Economy". And finally, on the crossing of the fourth horizontal segment ("near future") and the fourth third vertical segment ("very high ") there is a square "Shared Intelligence Economy".

VII. Find in the text English equivalents for the following

главная диагональ, пересекающиеся линии, вертикаль, горизонталь, разделить на отрезки, крайний слева, самый нижний, немного правее, равные части, третий сегмент, справа налево, сверху вниз.

VIII. Draw the circular flow (it will be different from the one in the unit!) and describe it using all the active possible

IX. Answer the questions

1. What stages of the development of the economy do you know?
2. When was the third type of the global economy?

3. When did the "Service Economy" take place?
4. Why have the business-forecasting models fallen out of favor?
5. Spreadsheets are the substitute for knowledge-based models, aren't they?
6. Have intelligent models been replaced by the knowledge-based models or by the ubiquitous spreadsheet?
7. How many broad technologies does the adaptive model involve?
8. What does the Fuzzy logic mean?
9. How does the genetic algorithm work?

X. Translate using all the active possible

1. В связи с проведением бизнес и научных исследований, модели прогнозирования были заменены на более краткосрочные аналитические методы.
2. Экономическое моделирование, прогнозирование продаж и анализ воздействия переменных, оказали значительное влияние на бизнес.
3. Тремя основными методами адаптивной модели являются: нечёткие множества, вскрытие данных и генетические алгоритмы.

XI. Make up the dialogue

You are a manager and you going hire an employee. Ask him about his qualities, skills, education and working experience.

PART II SYNERGY INFORMATION SYSTEMS

UNIT 13 RATIONAL CHOICE MODELS

Decision-making is first founded on a '*decomposability principle*' which asserts the existence of autonomous entities able to perform actions on a physical environment. It can be made more precise by means of two postulates. The 'actorialist postulate' states that the social fabric can be broken down into specific entities displaying independent behavior. The 'actionalist postulate' states that the actor's behavior can be broken down into parallel and sequential actions. The decomposability principle is at the heart of 'methodological individualism', which states that any social phenomenon can be reduced to the combination of actions of decision-makers. However, the decomposability principle does not assume that decision-making is only relevant at the level of individuals, but that it can also be considered at the level of collective entities (firms, governments, etc.).

The decision process is assumed to take place in three phases, relating the decision-maker reciprocally to his environment. The 'information phase' assumes that the decision-maker gathers certain signals about his environment, through sensors and filters, and then categorizes and organizes these signals into pieces of information. The 'deliberation phase' assumes that the decision-maker mentally processes his information in order to form an intention (or plan of action). The 'implementation phase' assumes that the decision-maker breaks down and schedules the plans of action, then transforms them into actions on the environment, through effectors and instruments. The three phases are assumed to take place sequentially without feedback from one phase to a preceding one.

Decision-making is essentially founded on a '*rationality principle*' which asserts that the deliberation phase is a kind of reasoning supported by certain mental states that are specific to the decision-maker. It can be made more precise thanks to two postulates. The 'consequentialist postulate' states that the decision is arrived at by considering only the consequences of each action. The 'utilitarian postulate' states that the consequences of an action are evaluated by trading of their costs and benefits.

The deliberation phase can be broken down into three steps, each involved with a specific 'determinant' acting as a mental state. The 'generation step' assumes that the decision-maker, given his '*opportunities*', delineates a set of available actions. The 'prediction step' assumes that the decision-maker, given his '*beliefs*', predicts the consequences of each possible action on his environment. The 'evaluation step' assumes that the decision-maker, given his '*preferences*', weights the expected consequences in a synthetic utility index. Moreover, the mental states are considered as independent, especially as concerns beliefs and preferences, which are supposed not to influence each other.

Two types of rationality can be considered in relation to the different steps in the deliberation process. 'Instrumental rationality' expresses the fit realized by the decision-maker between the means at his disposal and the objectives he pursues. 'Cognitive rationality' expresses the fit realized by the decision-maker between the representations he adopts and the information he possesses. On a first level, cognitive rationality concerns the formation of the decision-maker's beliefs about his environment and himself. On a second level, it concerns reasoning supported by all mental states and leading to a choice. Cognitive rationality may be reduced to instrumental rationality by assuming that the actor uses his information optimally to form his beliefs. But instrumental rationality is more naturally reduced to cognitive rationality, since opportunities and preferences are supported by beliefs and their combination is achieved through a specific form of reasoning.

The framework provided by the rational choice model is too general to be applied as such to a given decision problem. It needs a more precise specification of the determinants involved and of the principle which articulates them.

The decision-making process of a surgeon, faced with a patient, illustrates the three phases described above. The information phase consists in establishing a diagnosis of the patient's possible illness on the basis of clinical observations realized either directly (pulse check) or indirectly (blood analysis). The deliberation phase consists in choosing a treatment appropriate to the probable illness, taking into account the state of the art of the surgical techniques involved and their expected cost and efficiently. The implementation phase consists in carrying out the operation, after defining its place, date and concrete modalities and taking into account certain hazards which may occur during the operation.

VOCABULARY NOTES

decision-making – принятие решений
decomposability principle – правило разложения
assert – утверждать
precise – точный
social fabric – общественное устройство
assume – предполагать, допускать
reduced to – приводить к
sequential actions – последовательные действия
reciprocally – взаимно
pieces of information – порции информации
deliberation phase – этап размышлений
intention – цель
schedule – планировать
implementation phase – этап исполнения
reasoning – рассуждения
mental state – психическое состояние
consequentialist postulate – косвенное правило
utilitarian postulate – практическое правило
delineate – определять
beliefs – убеждения
synthetic utility index – искусственный индекс полезности
in relation – относительно
fit – соответствие
representation – утверждение
cognitive rationality – познавательная рациональность
instrumental rationality – действенная рациональность
framework – структура
applied – практичный, прикладной
involved – участвующий
articulate – координировать, соединять

ASSIGNMENTS

1. Suggest the Russian equivalents.

Existence of autonomous entities able to perform actions; social fabric can be broken down; parallel and sequential actions; be considered at the level of collective entities; to take place in three phases; mentally processes; schedules the plans of action; decision is arrived; action are evaluated; broken down into three steps; considered in relation to; too general to be applied.

2. Replace the parts of italics by synonyms.

It can be made more *precise*; consequences of an action are *evaluated*; decision is arrived at by *considering* only the consequences of each action; *beliefs*; *deliberation* process; *instrumental* rationality; *reasoning* supported by; the *objectives* he pursues.

3. Fill in the gaps with the words and expressions/ran the text.

1) The ‘actorialist postulate’ states that the social fabric can be _____ _____ into specific entities.
2) The decision process is assumed to take place in _____ _____.
3) The three phases are assumed to take place _____ without _____ from one phase to a preceding one.
4) Decision-making is essentially founded on a _____ _____.
5) The _____ _____ states that the decision is arrived at by considering only the consequences of each action.
6) The ‘generation step’ assumes that the decision-maker, given his , delineates a set of available actions.

7) The _____ _____ assumes that the decision-maker, given his preferences.
8) 'Instrumental rationality' _____ the fit realized by the decision-maker between the means at his disposal and the objectives he pursues.
9) Cognitive rationality may be _____ __ instrumental rationality.
10) The _____ provided by the rational choice model is too ___ to be applied as such to a given decision problem.

4. Find in the text English equivalents/or the following.

Модель рационального выбора; принцип разложения; обратная связь от данного этапа к предыдущему; принятие решений; рассуждения опираются на некоторые психические состояния того, кто принимает решение; индекс полезности; убеждения; рассматриваются как независимые касательно мнений и предпочтений; рассуждения, опирающиеся н; принять во внимание; риск.

5. Give explanations in English.

Broke down into; decision-maker; social phenomenon; mental state; utility index; three phases of decision process.

6. Answer the questions.

1) What is decision-making first founded on?
2) What does state the 'actionalist postulate'?
3) How many phases is the decision process assumed to take place in?
4) How does the decision-maker gather certain signals about environment in the 'information phase'?
5) Why is the rational choice model not used in solving problems?
6) Does the 'consequentialist postulate' or the 'utilitarian postulate' state that the consequences of an action are evaluated by trading of their costs and benefits?
7) What does the cognitive rationality concern on a first level?
8) What are three phases of decision process?
9) Which postulate does state that the social fabric can be broken down into specific entities displaying independent behavior?

7. Translate using all the active possible.

1) Процесс принятия решений предполагает наличие трех стадий.
2) Принцип разложения это центр методологического индивидуализма, который утверждает, что любое социальное явление может привести к комбинации действий того, кто принимает решение.
3) Практический принцип утверждает, что результат действий оценивается затратами и прибылью.
4) Действенная рациональность более естественно приводит к познавательной рациональности, так как возможности и предпочтения, опирающиеся на мнения, достигаются посредством специфической формы рассуждений.
5) Пределы, обусловленные моделью рационального выбора, являются слишком обобщенными для прикладного применения в решении проблемы.

8. Make up the dialogue.

You are going to optimize your manufacture. Ask for a specialist's advice. Describe the structure of costs and profits.

9. Additional exercise.

Write a description of manufacture.

UNIT 14 COMPLEX SYSTEMS

An economy is usually classified as a manifestation of complex social systems. To clarify this statement, we have to discuss what we mean by complex systems. Unfortunately, an exact definition of complex systems is still an open problem. In a heuristic manner, we may describe them as:

Complex systems are composed of many particles, or objects, or elements that may be of the same or different kinds. The elements may interact in a more or less complicated fashion by more or less nonlinear couplings. In order to give this formal definition a physical context, we should qualitatively discuss some typical systems that may be denoted truly complex.

The various branches of science offer us numerous examples, some of which turn out to be rather simple, whereas others may be called truly complex. The permanent change of the structure due to the influence of external fields and the interaction between the components is a characteristic feature of complex systems.

Another standard complex system is Earth's climate, encompassing all components of the atmosphere, biosphere, cryosphere, and oceans and con sidering the effects of extraterrestrial processes such as solar radiation and tides.

Computers and information networks are interpreted as a new class of complex systems. This is especially so with respect to hardware dealing with artificial intelligence, where knowledge and learning processing will be replacing the standard algebra of logic. In biology, we are again dealing with complex systems. Each higher animal consists of various strongly interacting organs with an enormous number of complex functions. Each organ contains many partially very strong specialized cells that cooperate in a well-regulated fashion. Probably the most complex organ is the human brain, composed of 1011 nerve cells. Their collective interaction allows us to recognize visual and acoustic patterns, to speak, or to perform other mental functions.

Probably the most complex system in our world is the global human society, especially the economy, with its numerous participants (such as managers, employers, and consumers) its capital goods (such as machines, factories, and research centers), its natural resources, its traffic, and its financial systems, which provides us with another large class of complex systems. Economic systems are embedded in the more comprehensive human societies, with their various human activities and their political, ideological, ethical, cultural, or communicative habits.

All of these systems are characterized by permanent structural changes on various scales, indicating an evolution far from thermodynamic equilibrium. The basic constituents of each complex system are its elements, which are expected to have only a few degrees of freedom.

Starting from this microscopic level, we wish to explain the evolution of a complex system at larger scales. Probably, we would arrive at a quite different description of the system at the macroscopic level. Definitely, we have to deal with two problems.

First, we have to clarify the scales of interest, and then we have to show that the more or less chaotic motion of the elements contributes to pronounced collective phenomena at macroscopic scales. The definition of correct microscopic scales as well as suitable macroscopic scales may sometimes be an ambiguous problem.

A macroscopic description allows a strong compression of data so that we are no longer concerned with the microscopic motion but rather with properties at large scales. The appropriate choice of the macroscopic level is by no means a trivial problem. It depends strongly on the question in mind. In order to deal with complex systems, we quite often still have to find adequate variables or relevant quantities to describe the properties of these systems. Each macroscopic system contains a set of usually collective large-scale quantities that may be of interest for the underlying problem. We will denote such degrees of freedom as relevant quantities. The knowledge of these quantities permits the characterization of a special feature of the complex system at the macroscopic level.

The second problem in treating complex systems consists in establishing relations that allow some predictions about the future evolution of the relevant quantities. Unfortunately, the motions of the irrelevant and relevant degrees of freedom of a complex system are normally coupled strongly together. Therefore, an accurate prediction of future values of the relevant degrees of freedom includes automatically the determination of the accurate evolution of the irrelevant degrees of freedom.

This strategy is naturally a hopeless attempt, independent from the underlying complex system. But a formal possibility to estimate an upper boundary for the total number of degrees of freedom is nevertheless offered. To this aim, we may isolate at a certain time the complex system, including a sufficiently large part of its environment. The momentary state of the isolated system is now considered

as an initial condition for further evolution. If the further development of the relevant degrees of freedom runs as it would in the open system, the isolated system is sufficiently large for a quantitative description of the contained complex system.

Self-organization requires a 'macroscopic' system, consisting of many nonlinearly interacting subsystems. Depending on the external control parameters (environment, energy-fluxes) self-organization takes place. Synergetics is an interdisciplinary science explaining the formation and self-organization of patterns and structures in open systems far from thermodynamic equilibrium.

Vocabulary notes:

in a heuristic manner эвристическим образом.
the various branches в различных отраслях.
numerous participants многочисленных участников.
thermodynamic equilibrium термодинамического равновесия.
to clarify the scales уточнить масштабы.
concerned будучи обеспокоен
denote such degrees обозначение такой степени.
permits the characterization позволяет характеристики.
an accurate prediction точного прогноза.
a hopeless attempt безнадежная попытка.
underlying complex system лежащие в основе сложной системы.
to estimate оценить.
upper boundary верхней границы.
nevertheless offered тем не менее, предложил.
sufficiently large part достаточно большой части.
initial condition исходное состояние.
sufficiently large достаточно велико.
quantitative description количественное описание.
nonlinearly interacting subsystems нелинейно взаимодействующих подсистем.
energy-fluxes энергии потоков.
interdisciplinary science междисциплинарная наука

Assignments

I. Suggest the Russian equivalents

Usually classified, an exact definition, many particles, different kinds, nonlinear couplings, in order , physical context, some typical systems, truly complex, to be rather simple, external fields, feature of complex systems, extraterrestrial processes, solar radiation.

*II. Replace the parts in **italics** by synonyms*

In order to give this formal definition a physical context;
we should qualitatively discuss some *typical* systems that may be denoted truly *complex*;
probably the most complex system in our world is the global human society;
especially the economy, with its *numerous*.

III. Fill in the gaps -with the words and expressions/ran the text

1. All of these systems are _____ by permanent structural changes on various scales, indicating an evolution far from thermodynamic equilibrium.
2. Starting from this _____ level, we wish to explain the evolution of a _____ system at larger scales.
3. The definition of correct microscopic _____ as well as suitable macroscopic scales may sometimes be an ambiguous _____.
4. In order to deal with complex systems, we _____often still have to find adequate variables or relevant quantities to _____describe the properties of these systems.
5. Therefore, an accurate prediction of _____ values of the relevant degrees of freedom includes automatically the determination of the accurate evolution of the irrelevant _____

of freedom.

6. If the further development of the relevant degrees of freedom _____ as it would in the open system, the isolated system is sufficiently large for a quantitative description of the contained complex _____.
7. Each higher animal consists of various strongly _____ organs with an enormous number of complex functions.
8. The various branches of science offer us numerous _____, some of which turn out to be rather simple, whereas others may be called truly complex.
9. Another standard complex system is Earth's _____, encompassing all components of the atmosphere, biosphere, cryosphere, and oceans and _____ the effects of extraterrestrial processes such as solar radiation and tides.
10. This is especially so with respect to _____ dealing with artificial intelligence, where knowledge and learning processing will be replacing the standard algebra of logic.

IV. Find in the text English equivalents/or the following

Элементы могут взаимодействовать, является характерной особенностью сложных систем, солнечная радиация и приливы, наиболее сложный орган человеческого мозга, руководителей, работодателей и потребителей, небольшим числом степеней свободы, заключается в установлении отношений, автоматическое определения точной эволюции, достаточно значительная часть, охрана окружающей среды, энергетические потоки, самоорганизации моделей и структур в открытых системах.

V. Give explanations in English

Composed of many particles, a physical context, all components of the atmosphere, mental functions, numerous participants, capital goods, thermodynamic equilibrium, synergetics.

VI. Answer the questions

What is naturally a hopeless attempt, independent from the underlying complex system?

Do we have to deal with two problems?

What contains a set of usually collective large-scale quantities that may be of interest for the underlying problem?

What state of the isolated system is now considered as an initial condition for further evolution.

How many systems are characterized by permanent structural changes on various scales, indicating an evolution far from thermodynamic equilibrium.

VII. Translate using all the active possible

1. Различные области науки предлагают нам множество примеров, некоторые из них оказались довольно просты, в то время как другие могут быть действительно сложным.
2. Компьютеры и информационные сети рассматриваются как новый класс сложных систем.
3. Все эти системы характеризуются постоянными структурными изменениями в различных масштабах, с указанием эволюции далеких от термодинамического равновесия.
4. Исходя из этого на микроскопическом уровне, мы хотели бы объяснить эволюцию сложных систем в более крупных масштабах.
5. Мгновенное состояние изолированной системы в настоящее время рассматривается в качестве начального условия для дальнейшей эволюции.
6. В зависимости от внешних параметров управления (охрана окружающей среды, энергетические потоки) происходит самоорганизация.

VII. Make up the dialogue

You are going to start to study evolution of difficult systems. Ask the person which is engaged in it how to make it.

UNIT 15 OPEN AND CLOSED SYSTEMS

A system is commonly defined as a group of interacting units or elements that have a common purpose. The units or elements of a system can be wires, people, computers, and so on. Systems are generally classified as open systems and closed systems and they can take the form of mechanical, biological, or social systems. Open systems refer to systems that interact with other systems or the outside environment, whereas closed systems refer to systems having relatively little interaction with other systems or the outside environment. For example, living organisms are considered open systems because they take in substances from their environment such as food and air and return other substances to their environment. Similarly, some organizations consume raw materials in the production of products and emit finished goods and pollution as a result.

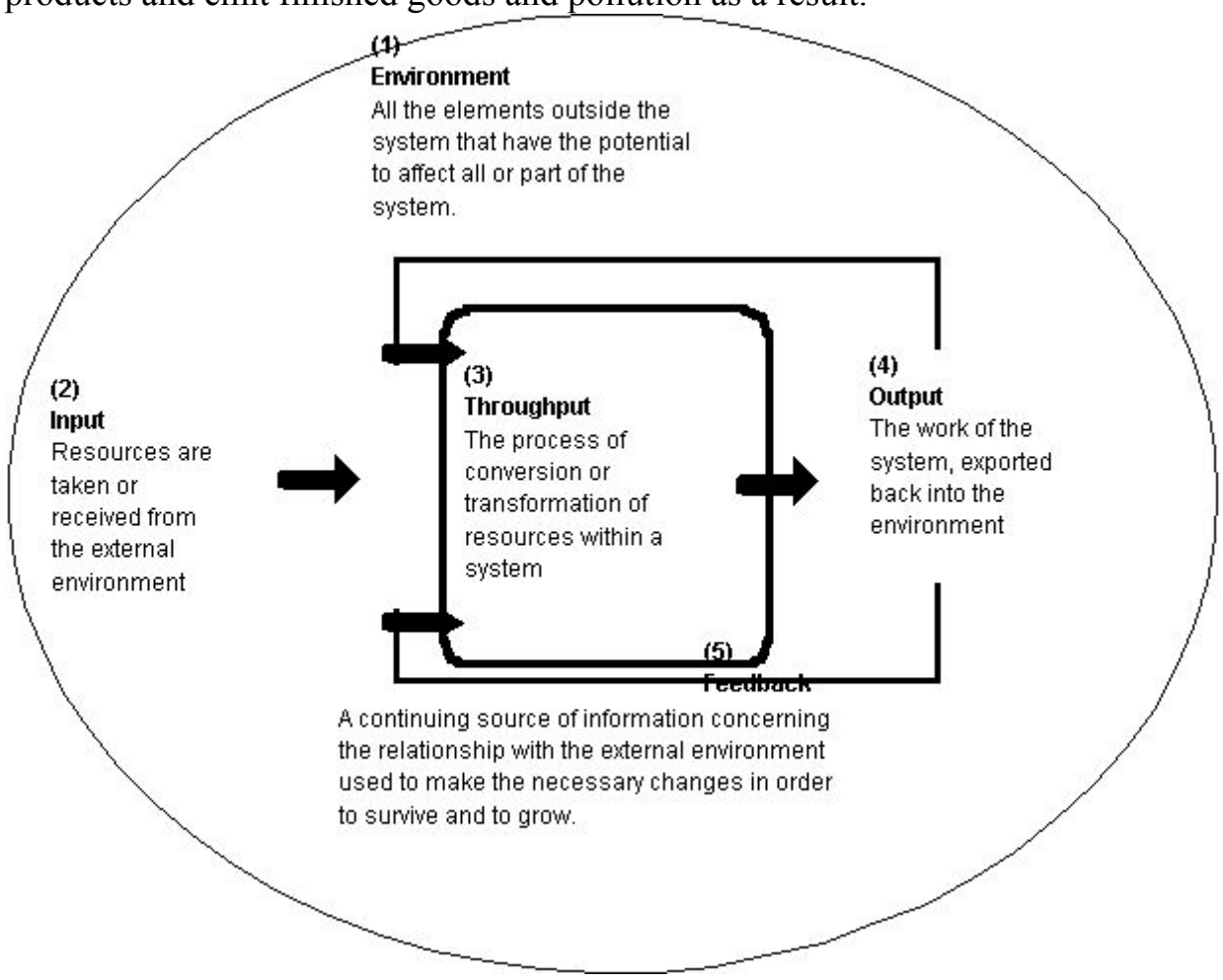


Figure 1 – Basic Open System Model

All systems have boundaries. The boundaries of open systems are more flexible than those of closed systems, which are rigid and largely impenetrable. A closed-system perspective views organizations as relatively independent of environmental influences. The closed-system approach conceives of the organization as a system of management, technology, personnel, equipment, and materials, but tends to exclude competitors, suppliers, distributors, and governmental regulators. This approach allows managers and organizational theorists to analyze problems by examining the internal structure of a business with little consideration of the external environment.

Open-systems theory originated in the natural sciences and subsequently spread to fields as diverse as computer science, ecology, engineering, management, and psychotherapy. In contrast to closed-systems, the open-system perspective views an organization as an entity that takes inputs from the environment, transforms them, and releases them as outputs in tandem with reciprocal effects on the organization itself along with the environment in which the organization operates. That is, the organization becomes part and parcel of the environment in which it is situated.

As an open-systems approach spread among organizational theorists, managers began incorporating these views into practice. Two early pioneers in this effort, Daniel Katz and Robert Kahn, began viewing organizations as open social systems with specialized and interdependent subsystems and processes of communication, feedback, and management linking the subsystems. Katz and Kahn argued that the closed-system approach fails to take into account how organizations are reciprocally dependent on external environments. For example, environmental forces such as customers and competitors exert considerable influence on corporations, highlighting the essential relationship between an organization and its environment as well as the importance of maintaining external inputs to

achieve a stable organization.

Furthermore, the open-system approach serves as a model of business activity; that is, business as a process of transforming inputs to outputs while realizing that inputs are taken from the external environment and outputs are placed into this same environment. Companies use inputs such as labor, funds, equipment, and materials to produce goods or to provide services and they design their subsystems to attain these goals.

The production subsystem, for example, focuses on converting inputs into marketable outputs and often constitutes a primary purpose of a company. The boundary subsystem's goal is to obtain inputs or resources, such as employees, materials, equipment, and so forth, from the environment outside of the company, which are necessary for the production subsystem. This adaptive subsystem collects and processes information about a company's operations with the goal of aiding the company's adaptation to external conditions in its environment. The management subsystem must resolve conflicts, solve problems, allocate resources, and so on.

Managers must take into consideration their organization's position along the open-closed continuum. The Linux computer operating system, for instance, is "open-source" and Red Hat, Inc., the corporation selling the bundled revisions-the multiple inputs from geographically dispersed users-represents an organization that would cease to exist if it were not for an open-systems perspective. Thus, stable environments with low complexity are more consistent with a relatively closed-system or mechanistic management style, while rapidly-changing environments are more consistent with flexible, decentralized, or "organic" management styles.

VOCABULARY NOTES

group of interacting units – группа взаимозависимых единиц
wires – провода
outside environment – внешняя среда
whereas – несмотря на то, что
consider – рассматривать
raw materials – сырье
emit finished goods – выпускаемая готовая продукция
boundary – границы
flexible – гибкий
rigid and largely impenetrable – жесткая (негибкая) и не поддающаяся воздействию
competitor – конкурент
supplier – поставщик
entity – организация
reciprocal effects – взаимное влияние
pioneer – первооткрыватель
feedback – обратная связь
fail – терпеть неудачу
highlight – основной момент
furthermore – кроме того
attain goals – достижение целей
marketable outputs – товарный выход
aiding the company's adaptation – содействие адаптации компании
stable environments – стабильные условия
rapidly-changing environments – быстро-изменяющиеся условия

Assignments

I. Suggest the Russian equivalents

Common purpose, open systems, closed systems, outside environment, raw materials, finished goods, environmental influence, social systems, interdependent subsystems, boundary subsystem's goal, external conditions.

II. Fill in the gaps -with the words and expressions/ran the text

1. A system is commonly defined as a _____ of interacting units or __ that have a common purpose
2. Open systems refer to systems that interact with other systems or the outside .

3. The boundaries of open systems are more than those of closed systems, which are and largely impenetrable.
4. Open-systems theory originated in the natural sciences and subsequently spread to fields as diverse as , , , management, and psychotherapy.
5. The production subsystem, for example, focuses on converting _____ into marketable __ and often constitutes a primary purpose of a company.
6. Companies use inputs such as labor, , , and to produce goods or to provide services and they design their subsystems to attain these goals.
7. The management subsystem must resolve _____, solve problems, allocate _____, and so on.
8. The boundary subsystem's goal is to obtain inputs or resources, such as , , , and so forth, from the environment outside of the company, which are necessary for the production subsystem.
9. Managers must take into consideration their organization's position along the ___ ____ ____.

III. Find in the text English equivalents/or the following

Открытая система, закрытая система, денежный поток, решение проблемы, сырье, готовая продукция, достигать цели, основная цель, внешняя среда

IV. Give explanations in English

Open systems, finished goods, input, output, environment, system.

V. Translate using all the active possible

1. Системы – группа взаимодействующих единиц или элементов, имеющие общую цель
2. Открытые системы относятся к системам, которые взаимодействуют с другими системами или внешней средой, в то время как закрытые системы относятся к системам, имеющим сравнительно малое взаимодействия с ними
3. Открытый системный подход выступает в качестве модели предпринимательской деятельности, то есть бизнес рассматривается как процесс преобразования входных параметров в выходные, при условии, что входные параметры взяты из внешней среды, а выходные размещаются в этой же среде.
4. Подсистема управления должны решать конфликты, проблемы, распределять ресурсы, и так далее.
5. Этот подход позволяет руководителям анализировать проблемы путем изучения внутренней структуры предприятия, пренебрегая внешней средой.

VI. Answer the questions

1. What is the difference between Open and Closed Systems?
2. What Is an Open Systems?
3. What Is a Closed Systems?
4. What does the figure suggest?
5. Who are Daniel Katz and Robert Kahn?

VII. Translate using all the active possible

СИСТЕМА — это некоторая целостность, состоящая из взаимозависимых частей, каждая из которых вносит свой вклад в характеристики целого. Машины, компьютеры, телевизоры — все это примеры систем. Они состоят из множества частей, каждая из которых работает во взаимодействии с другими для создания целого, имеющего свои конкретные свойства. Эти части взаимозависимы. Если одна из них будет отсутствовать или неправильно функционировать, то и вся система будет функционировать неправильно.

integrity – целостность
correlation – взаимозависимый
interaction – взаимодействие
specific properties – конкретные свойства

VIII. Additional exercise

Write a formal letter to the university to ask for more information about hostel accommodation.

IX. Additional exercise. Answer these questions

1. What qualities make a good interviewer/secretary/sales rep./managing director?
2. What information should you include in a CV? What order should it be in?
3. What is a typical salary in your country for a secretary/sales rep.?
4. Would you rather have a high salary and no bonus, or an average salary and possible bonuses?
5. When was the last time you were an interviewee? How did you feel?

UNIT 16 CONCEPTS OF SYNERGY

The concept of synergy is at the core of resource-based thinking, dating back to Edith Penrose's seminal contribution. More specifically Penrose, without using the actual word though, was concerned with two forms of synergy: the possibility of sharing particularly managerial resources, which is brought about due to inevitable indivisibilities of resources, and transfer of excess (and limitedly tradeable) resources. Synergy is the strategic benefits that arise when connecting two or more enterprises in the same hands.

According to Porter those are the only kinds of synergy available to firms, but this paper will hopefully make it clear that his conception is too narrow in scope.

Synergy and economies of scope

First I would like to return to the original conception of synergy in the field of management and economics and then discuss the differences between the concepts of synergy and economies of scope. Ansoff describes four types of synergy: *Sales synergy* which occurs when different products use common distribution channels, common sales administration, or common warehousing.

1. *Operating synergy* which includes higher utilization of facilities and personnel, spreading of overhead, advantages of common learning curves, and large-lot purchasing.
2. *Investment synergy* is the result of joint use of plant, common raw materials inventories, transfer of R&D from one product to another, common tooling and machinery.
3. *Managerial synergy* is possible when a new business venture faces strategic, organizational or operating problems which are similar to problems that the management has dealt with in the past.

Increased revenue may be the effect of economies of scope since (part of) the cost reduction can be used to reduce the prices. However this is contingent on the price elasticity of demand which has to be sufficiently high for the product in question to offset the lower price pr. product. Increased revenue through lower prices also requires that the economies of scope can be obtained without congestion since production has to be increased. Since economies of scope has been conceived from a production perspective, the literature on economies of scope does not consider the possibility of increasing revenue through positive externalities from supplying complementary products. These externalities can in part be explained by reduced transaction costs (e.g. reduced search and negotiation costs) and increased utility for the buyer.

Reducing the necessary level of investment in the introduction of new products can be obtained by sharing existing resources as long as congestion does not occur. Congestion is likely to happen when the shared resources are either tangible or financial, while intangible resources have expandable capacity . Reducing the need for investment could also be the result of scale economies in upstream activities or learning economies where learning from past experiences makes it cheaper for the firm to engage in similar activities by avoiding mistakes and discovering new ways of doing things.

Markides and Williamson thus introduces a more dynamic view of synergy where, in the last three kinds of synergy, the company's competences are used to build new assets, and thereby establish a better fit between the company's pool of resources and the opportunities for growth. This calls for a distinction between a static view of synergy dealing with the sharing of stocks of existing assets between different businesses (asset amortization) which is implied in the usual definitions of synergy and economies of scope, and a more dynamic (process) view on synergy concerned with the sharing (amortization) of competences and accumulation of new assets.

Synergy and complementarity

The Markides and Williamson analysis does not capture another difference between the definitions of synergy and economies of scope. It is obvious from the definitions that synergy is a superadditive function while economies of scope are based on subadditivity. Neither Ansoff's definition nor the four kinds of synergies developed by Markides and Williamson does, however, adress this difference. The concept of *complementarity* explicitly focuses on superadditivity in performing complementary activities

Depending on the definition of symmetry, this could be taken to mean that the increases in value have to be numerically similar, if certain activities were to be termed complementary. This seems to be a too narrow conception of the complementarity effect for practical purposes. It also eliminates the possible substitution of the synergy concept for the complementarity concept, since synergy is not conditioned on symmetry. Of the four kinds of synergy mentioned by Markides and Williamson only asset amortization can be said to imply symmetry, while the others - asset improvement, asset creation and asset fission does not, because utilizing the capabilities obtained from developing an asset in one

business unit to build or improve an asset in another business unit does not enhance the value of the original asset. Thus increasing the stock of asset **b** does not increase the value of increasing the stock of asset **a**, allthough it may strengthen the asset-improving or asset building capability through learning and amortize the costs of developing that capability.

The concept of complementarity is however more dynamic than Ansoff's definition of synergy in that: *"investments at different points in time are mutually complementary, so higher early investments increase the pace of later investments."*. The concept of complementarity can thereby enrich the concept of synergy, which treats investments as separate in the simple definition by Ansoff.

Vocabulary Notes

the possibility of sharing managerial resources – возможность совместного использования управленческих ресурсов
the large-lot purchasing – крупная партия покупок
the cost reduction – сокращение затрат
the price elasticity of demand – эластичность спроса по цене
the supplying complementary products – дополнительные поставки продукции
investment – инвестиции
intangible resources – нематериальные ресурсы
of doing things – вести дела
the sharing of stocks – обмен акций
complementarity – взаимодополняемость
performing activities – проводить мероприятия
joint production – совместное производство
the process of asset accumulation – накопление активов
the maintenance – техническое обслуживание
assets – активы
the company's pool of resources – запасы компании
business – подразделения
the original asset – первоночальные активы
the costs of developing – расходы на разработку
different points in time – различные моменты времени
of excess resources – избыточные ресурсы
limitedly tradeable resources – ограничение экспортируемых ресурсов
transaction costs – операционные издержки
negotiation resources – переговоры
asset fission – распределение активов

Assignments

1. Suggets the Russion equivalents
common raw materials inventories; accumulation of new assets; increased revenue; dependence of the price elasticity of demand; offset the lower price; uninterrupted production; reduced transaction costs; sharing existing resources; performing complementary activities

2. Replace the parts in italics by synonyms
synergy which includes higher utilization of facilities and *large-lot* purchasing; a new business venture faces *operating* problems; the *cost* reduction can be used to reduce the *prices*; reducing of *investment* can be obtained by sharing existing resources; increase in income leads to increased *production; amortization* of assets

3. Fill in the gaps with the words and expressions/ran the text
1. Synergetics is devoted to two forms of interaction: _____ particularly managerial resources, which is brought about due to inevitable indivisibilities of resources, and _____.
2. _____ based on the use of funds and personnel, distribution of overhead costs, the benefits of general learning curves, and the use of large quantities of purchases.
3. _____ is the result of joint use of plant, common raw materials inventories,

transfer of R&D from one product to another, common tooling and machinery.
4. _____ occurs when the new company faces with strategic, organizational or operational problems.
5. sharing takes place only when used to reduce costs if the cost of a value activity is driven by economies of _____ or _____.
6. _____ may be the effect of economies of scope since (part of) the cost reduction can be used to reduce the prices.
7. The reduction costs can be used to reduce the price if _____of high for this product, which allows you to compensate for low prices
8. The increase in income due to lower costs achieved only in that case, _____ is continuously.
9. Reducing _____ in the introduction of new products can be obtained by sharing existing resources as long as congestion does not occur.
10. Reduced investment requirements could also be the result of savings of _____ and _____.
11._____ is the growth performance of the merger, compared with the activity before the merger.
12. In terms of synergy with an increase in production is not considered a positive externality coefficient supply of _____, which leads to an increase in profits.
13. _____ is to lower the transaction costs (by reducing the amount of resources per unit of output)
14. _____ is occurs when different products use common distribution channels, common sales administration, or common warehousing
15. Revenue growth at the expense of _____ is obtained through additional deliveries.
16. Reducing the level of _____in introducing new products is achieved through the exchange of available resources and leads to the formation of "disruption" of production.

4. Find in the text English equivalents/or the following
накладные расходы; производственные мощности; уменьшение инвестиций; внешний эффект; полезность продукта для потребителя; операционные издержеки; внедрение новых продуктов; стратегические активы; возможности экономического роста; взаимодополняемость товаров; экономическая точка зрения; совершенствование активов; некоторые виды деятельности; амортизировать расходы на разработку; количество активов; практические цели.

5. Give explanations in English
material resources; financial resources; intangible resources; operating costs; the price elasticity of demand; amortization of assets; organization costs; complementary goods; the process of asset accumulation

6. Answer the questions
1. What are the components is synergetics? What do they decide?
2. What is the elasticity of synergetics?
3. Why are formed stagnation of production?
4. What is the utility buyer?
5. What is operating synergetics?
6. What is i*nvestment synergy?*
7. What is m*anagerial synergy?*

7. Translate using all the active possible
1. Концепция взаимодействия заключается в возможность совместного использования ресурсов, особенно управленческих, с одной стороны, и передаче избыточных ресурсов – с другой.
2. Сокращение необходимого уровня инвестиций при внедрении новых продуктов могут быть получены путем обмена имеющихся ресурсов до тех пор, пока не образовываются «застои» производства, которые могут произойти из-за сокращения общих ресурсов, либо

материальных или финансовых.

3. Полезность для покупателя может заключаться в снижение операционных издержек (за счет уменьшения количества ресурсов на единицу продукции), что в свою очередь приводит к снижению цены.
4. С экономической точки зрения при увеличении производства не рассматривают факторы, которые приводят к росту доходов за счет положительного внешнего коэффициента от поставок дополнительных единиц продукции.

8. Make up the dialogue

You are going to start your own business. Ask a lawyer or an experienced person how to do it

UNIT 17 CHAOS MODELS IN ECONOMICS

Chaos in exchange rates

For the *simulation of the volatile behavior* of the *exchange rates* were created models that treat the exchange rates as being prices of the *financial assessments* traded on *efficient markets*.

The current exchange rate contains the currently available information and the changes observed reflect the effect of the new events that are unpredictable by definition.

The theory states that an accurate *a priori prediction* of the exchange rate evolution is impossible to be made but the subsequent explanation of the changes is possible. In order to eliminate these difficulties, the chaos theory and the *nonlinear models* are extensively used. The first researches have been carried out starting from 1980.

In the majority of situations these models are highly nonlinear and result in a wide range of dynamic behavior, including chaotic dynamics. There is a dispute over the manifestation of chaotic dynamics in exchange rates. There are many studies that are positive to the chaotic dynamics (Federici 2001, Westerhoff, Darvas 1998, Hommes 2005, Vandrocicz 2006) and also a number of studies that are rejecting the chaos in exchange rate (Brooks, Serletis).

The chaos theory demonstrates that even the simplest dynamical systems can *exhibit* at some point a very complex behavior. If the exchange rates variation is caused due to the chaotic nature of the system, this should lead to the fact that the smallest influences should have the effect of a nonlinearity over the exchange rates – exactly what happens in reality.

The first model presented demonstrates the fact that even the simplest models can *exhibit* chaotic behavior. The demand of foreign currency is determined as *percentage of the deviation* of current exchange rate towards the expected one.

$$S_t = \alpha\left(\frac{e^e}{e^t} - 1\right), \alpha \geq 0$$

where

e^t is the *domestic price* of the foreign currency

e^e is the future estimated exchange rate

α is the sensitivity parameter

The *trade balance* (Ti) is a *linear function* depending on the current exchange rates and the corresponding exchange rate for the last period, written as deviation from the expected values and is given by the equation:

The expected exchange rate represents the stable state at which the speculators on the market do not wish to sell nor buy.

$$Tt = \beta(e_t - e^e) + \gamma(e_{t-1} - e^e)\beta, \gamma \geq 0$$

The clearing of the exchange markets writes as:

$$\Delta S_t = Tt$$

After replacing equations (2) and (1) in (4), equation (4) becomes:

$$\beta e_{t-1} e_t^2 - [(\beta + \gamma)e^* e_{t-1} - \gamma e_{t-1}^2 - ae^*]e_t - \alpha e^* e_{t-1} = 0$$

The equation 5 has two roots, the positive one being considered for obvious reasons. The resulting nonlinear equation is:

for $\alpha=\beta=4$ and $\gamma=26$.

The graphical representation of the solution et show that the graph presents a *peak value* of 2.76 and a minimum value of 0.091. Any other value from outside the interval represented by these two values is attracted. The evolution of the system with the specified parameters is chaotic because satisfies the Ly-Yorke condition [3]. The Figure 2 illustrates the evolution of the system for two initial slightly

different values: 0.2 and 0.2005 (the dotted line). The values of the two time series are identical for a short period of time (the first 10 iterations) and then the trajectories of the systems are diverging.

The scatterplots for the two time series are provided to demonstrate the independence of the two time series after 10 iterations. The scatterplots presented in Figure 3 and Figure 4 one of the fingerprints of chaos: the distance between two trajectories starting from nearby points in the state space diverge over time.

When the *sensitivity parameter* is varied, the same effects can be observed. Figure 4 presents the trajectories of the system for two very near values of α.

The apparently *irrelevant changes* can affect the *longtime behavior* of the exchange rate modeled using the Ellis model and some of these small shocks can determine the system to fall into the chaotic regime.

VOCABULARY NOTES

a priori prediction - априорный прогноз
domestic price - цены на внутреннем рынке
efficient markets - эффективный рынок
exchange rates - валютный курс
financial assessments – финансовая оценка
irrelevant changes – второстепенные изменения
longtime behavior – долгосрочное состояние
nonlinear models – нелинейная модель
peak value - максимальная величина
percentage of the deviation – процент отклонения
scatterplots - диаграмма рассеяния
sensitivity parameter - параметр чувствительности
simulation of the volatile behavior – моделирование изменчивого поведения
trade balance - торговый баланс
linear function - линейная функция
exhibit **-** показывать

Assignments

I. Suggest the Russian equivalents
result in a wide range of dynamic behavior; the speculators on the market do not wish to sell nor buy; In order to eliminate these difficulties, exchange rates variation is caused due to, to fall into the chaotic regime.

II. *Replace the parts in **italics** by synonyms*
The apparently *irrelevant changes* can affect
The theory states that an *accurate* a priori prediction of the exchange rate
result in a wide range of dynamic behavior
the simplest dynamical systems can *exhibit*

III. Fill in the gaps -with the words and expressions/ran the text

1. The apparently ___ changes can affect the ____ behavior of the exchange rate modeled.
2. For the _____of the volatile behavior of the _____rates were created models.
3. In order to eliminate these difficulties, the chaos theory and the _____models are extensively used.
4. The _____balance (Ti) is a linear function depending on the current exchange rates.
5. The chaos theory demonstrates that even the simplest dynamical systems can _____at some point a very complex behavior.
6. The demand of foreign currency is determined as percentage of the _____of current exchange rate towards the expected one.
7. Models that treat the exchange rates as being prices of the _____ assessments traded on _____ markets.
8. In the majority of situations these models are highly _____ and result in a wide range of dynamic

behavior, including _____ dynamics.
9. The values of the two time series are identical for a short _____ of time and then the trajectories of the systems are _____.
10. The expected exchange rate represents the _____ state at which the _____ on the market do not wish to sell nor buy.

IV. Find in the text English equivalents/or the following

валютный курс, доступная информация, устранить трудности, нелинейная модель, хаотичная природа системы, отклонение, заданный уравнением

V. Give explanations in English

exchange rates , evolution, trade balance, demand, deviation, market, financial assessments, affect

VI. *Read the description*

Economic systems reflect the values, assumptions and goals of a particular culture. Subsistence economies, which prevail in the more remote and less industrialized areas of the world, place much value on ecology and living in harmony within the natural limits of their environment. Capitalist and Socialist economies both share the goal of generating material wealth but differ in their approach. Capitalist economies emphasize individual freedom while Socialist economies emphasize social equality. The Buddhist economic system, as described by E.F. Schumacher and lived by some Eastern countries, is centered on the goal of human fulfillment and the development of character.

Find in the text English equivalents for the following

Предположение, потребительское хозяйство, материальное благополучие, самореализация человечества, разделять цель, преобладать

VII. *Answer the questions*

1. What is theory about?
2. What does the chaos theory demonstrate?
3. When have the first researches been carried out?
4. Does anybody reject the chaos in exchange rate?
5. What is trade balance?

VIII. *Translate using all the active possible*

1. Видимо, второстепенные изменения могут влиять на долгосрочное состояние обменного курса.
2. В большинстве случаев эти модели существенно нелинейные и как результат мы видим широкий диапазон динамических характеристик, включая хаотическую динамику.
3. The chaos theory demonstrates that even the simplest dynamical systems can *exhibit* at some point a very complex behavior. Теория хаоса показывает, что даже самая простая динамическая система может указывать, в некоторой степени, на очень сложные формы поведения.

IX. *Make up the dialogue*

You are the single woman in your department, discuss gender-related qualities.

UNIT 18. ANALYTICAL FORECASTING

One crucial issue in risk management deals with analyzing what could go wrong with individual credits and portfolios, and factoring this information into the analysis of risk-adjusted returns, capital adequacy, and loan provisions. “What-if” analysis can unveil previously uncovered areas of credit risk exposures and plays the vital role of locking into areas of potential problems.

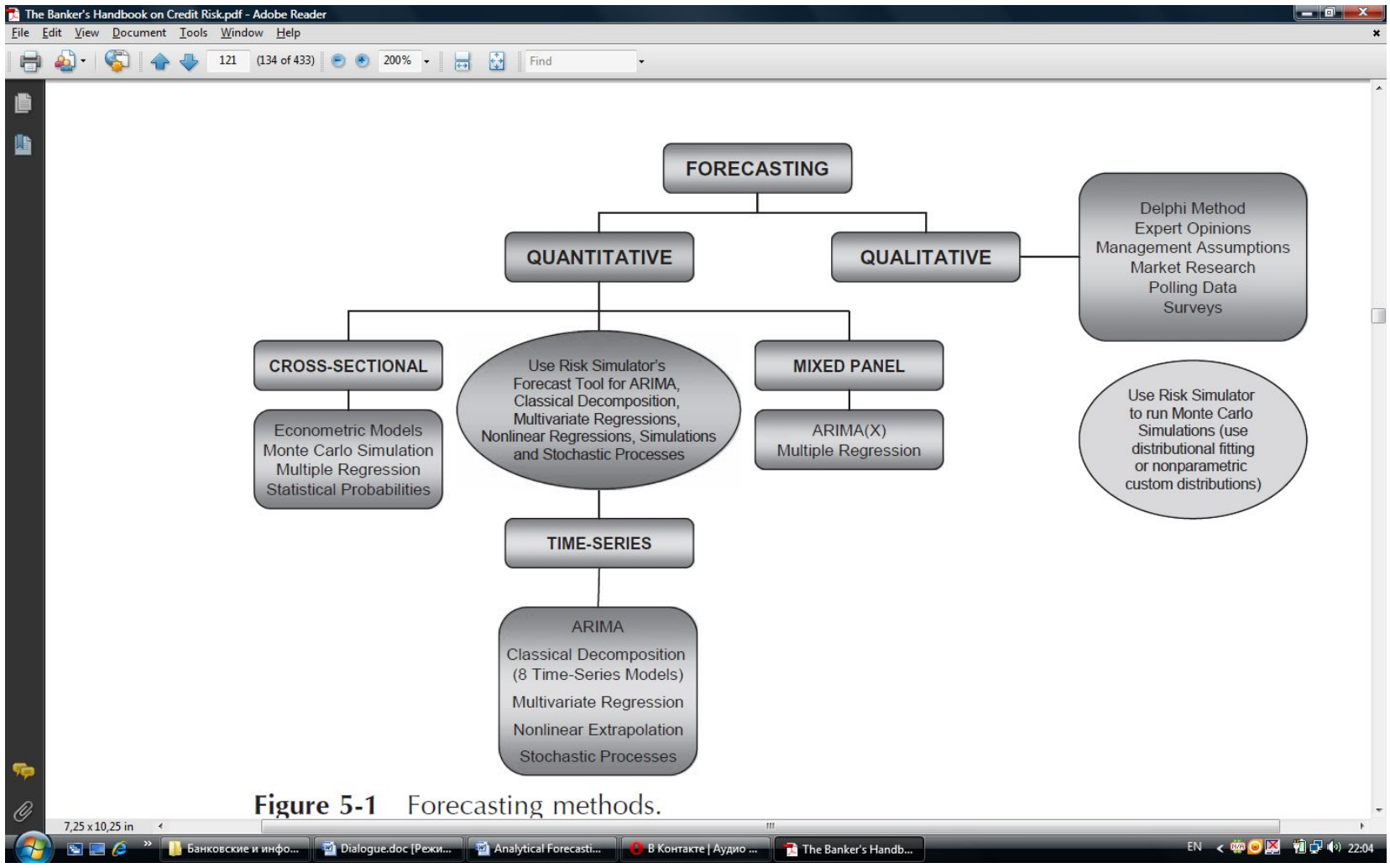
The Basel Committee on Banking Supervision states that “in the final analysis banks should attempt to identify the types of situations, such as economic downturns, both in the whole economy or in particular sectors, higher than expected levels of delinquencies and defaults, or the combinations of credit and market events, that could produce substantial losses or liquidity problems. Stress test analyses should also include contingency plans regarding actions management might take given certain scenarios.”

The emphasis on bank forecasts developed as loan demand increased to fund large and complex credits, including mergers and acquisitions. These new deals represented a new class of borrowers who pushed their financial structure to exceedingly high debt levels. As a result, lenders began to work with a new breed of sophisticated forecasting and valuation models that were able to predict expected default, financial needs, and shareholder value with much more accuracy and insight. Building projected financial statements around a set of critical assumptions or value drivers involves research, logic, and up-to-date predictive software—computers after all do not make credit decisions. They merely quantify assumptions about the future, serving as another tool, albeit an important one, in the loan decision-making process. The real value of computers is their ability to facilitate rapid analysis of many alternatives, mimicking a realistic environment as much as possible. When appropriate, the bank will run a “sensitivity analysis” examining the effect of changing key assumptions in any number of combinations in order to construct a range of outcomes from pessimistic to optimistic.

In determining the most suitable forecasting technique for a given situation, one of the first checks is comparability between forecast methods used and complexity of data or, for that matter, the deal. From the start lenders should be aware of both the benefits and pitfalls of each forecasting method before one is chosen. Under certain conditions, a preferred forecasting method may offer incomplete, inaccurate results in one situation while producing “OK” results in a similar analysis. Availability of comprehensive, historical data is the standard prerequisite for developing forecasts. Since different forecasting methods generally require various amounts of historical data, requirements for data quality (and quantity) may vary as well. The next prerequisite is accuracy—triple A-rated firms require little data, with accuracy hardly an issue, while B-rated customers may require plenty of verifiable information. In the former case, risks are insignificant, financial statements are strong, and the firm operates in nonvacillating surroundings. A forecast error of 30 percent or more is irrelevant, whereas a forecast error of 100 basis points may be enough to spell disaster for a borrower with a low rating.

Advanced Analytical Forecasting with Risk Simulator

Forecasting is the act of predicting the future, whether it is based on historical data or speculation about the future when no history exists. When historical data do exist, a quantitative or statistical approach is best, but if there are no such data, then a qualitative or judgmental approach is usually the only recourse. Figure 5.1 lists the most common methodologies for analytical forecasting. The other approaches for forecasting where more advanced techniques such as the generalized autoregressive conditional heteroskedasticity (GARCH) model, interpolation, spline extrapolation, and yield curve fitting and forecasting are discussed and applied using the Modeling Toolkit.



Different Types of Forecasting Techniques

Forecasting can be divided into quantitative and qualitative approaches. Qualitative forecasting is used when little to no reliable historical, contemporaneous, or comparable data exists. Qualitative methods include the Delphi or expert opinion approach (a consensus-building forecast by field experts, marketing experts, or internal staff members), management assumptions (target growth rates set by senior management), as well as market research or external data or polling and surveys (data obtained through third-party sources, industry and sector indexes, or active market research). These estimates can be either single-point estimates (an average consensus) or a set of prediction values (a distribution of predictions). Prediction values can be entered into Risk Simulator as a custom distribution, and the resulting predictions can be simulated; that is, a nonparametric simulation can be run using the prediction data points as the custom distribution.

For quantitative forecasting, available data or data that needs to be forecasted can be divided into time-series (values that possess a time element, such as revenues at different years, inflation rates, interest rates, market share, and failure rates); cross sectional (values that are ime-independent, such as the grade point average of sophomore students across the nation in a particular year, given each student's levels of SAT scores, IQ, and number of alcoholic beverages consumed per week); or mixed panel (mixture between time-series and panel data, e.g., predicting sales over the next 10 years given budgeted marketing expenses and market share projections, which means that the sales data is considered time-series but exogenous variables such as marketing expenses and market share exist to help to model the forecast predictions).

The Risk Simulator software provides the user with several forecasting methodologies, notably:

- Autoregressive integrated moving average (ARIMA)
- Auto ARIMA Models
- Basic Econometric Models
- Cubic Spline Interpolation and Extrapolation
- Data Diagnostics for Forecast Modeling
- GARCH Volatility
- J-S Curves
- Markov Chains
- Maximum Likelihood Estimation
- Multivariate Regression

- Nonlinear Extrapolation
- Stochastic Process Forecasting (Brownian Motion random walk, mean-reversion, jump-diffusion)
- Time-series Decomposition and Forecasting

VOCABULARY NOTES:

capital adequacy – достаточное количество капитала;
can unveil – может раскрыть;
previously uncovered areas of credit risk exposures - ранее непокрытых областей воздействия кредитного риска;
loan demand – спрос на кредиты;
a quantitative or statistical approach – количественный или субъективный подход;
data obtained through third-party sources – данные, полученные из сторонних источников;
a set of prediction values – набор прогнозных значений;
Autoregressive integrated moving average – авторегрессия скользящего среднего;
Cubic Spline Interpolation and Extrapolation – интерполяция кубическим сплайном и экстраполяция;
Assignments

I. Suggest the Russian equivalents

Lenders began to work with a new breed of sophisticated forecasting; a set of critical assumptions; up-to-date predictive software; the most suitable forecasting technique for a given situation; a preferred forecasting method may offer incomplete, inaccurate results; approaches for forecasting; quantitative and qualitative approaches; internal staff members; a distribution of predictions; time-series.

*II. Replace the parts in **italics** by synonyms*

Predictions about the future; when *information* exists; the most *plain* methodologies; *attitudes* for forecasting; forecasting can be *graded*; market share *predictions*.

III. Fill in the gaps -with the words and expressions from the text

1. One crucial issue in risk __ deals with analyzing.
2. Stress test __ should also include contingency plans regarding actions management might take given certain scenarios.
3. The emphasis on bank __ developed as loan demand increased to fund large and complex credits.
4. These new deals represented a new __ of borrowers who pushed their financial __ to exceedingly high debt levels.
5. The real __ of computers is their ability to facilitate rapid __ of many alternatives, mimicking a realistic environment as much as possible.
6. In determining the most suitable forecasting __ for a given situation, one of the first checks is comparability between forecast __ used and complexity of data or, for that matter, the deal.
7. A forecast __ of 30 __ or more is irrelevant, whereas a forecast error of 100 basis points may be enough to __ disaster for a borrower with a low rating.
8. __ is the act of predicting the |__, whether it is based on historical data or speculation about the future when no __ exists.
9. Figure 5.1 lists the most __ methodologies for analytical forecasting.
10. The other __ for forecasting where more advanced __ such as the generalized autoregressive conditional __ (GARCH) model, interpolation, spline extrapolation, and yield curve fitting and forecasting are discussed and applied using the Modeling Toolkit.
11. Forecasting can be __ into quantitative and __ approaches.
12. Prediction values can be __ into Risk Simulator as a custom distribution, and the resulting predictions can be __; that is, a __ simulation can be __ using the prediction data points as the custom distribution.
13. For quantitative __, available data or data that needs to be forecasted can be divided into __ (values that possess a time element, such as revenues at different years, inflation rates, interest rates,

market share, and failure rates); cross __ (values that are time-independent); or mixed panel (mixture between time-series and panel data, e.g., predicting sales over the next 10 years given budgeted marketing expenses and market share __, which __ that the sales data is considered time-series but __ variables such as __expenses and market share exist to help to model the forecast predictions).

14. The Risk __ software provides the user with __ forecasting methodologies.
15. Autoregressive integrated __ average.
16. Cubic Spline __.

IV. Find in the text English equivalents/or the following

Прогнозы на будущее; количественный или субъективный подходы; данные опросов; многомерная регрессия; моделирование методом Монте-Карло; классическое разложение; нелинейная регрессия; набор прогнозных значений; сечение; строительство прогнозируемых финансовых отчетов на основе ряда важных условий или факторов стоимости, предусматривает проведение исследований; реальная стоимость компьютеров заключается в их способности содействовать экспресс-анализу альтернатив; когда существуют исторические данные, количественный или статистический подход является наилучшим.

V. Give explanations in English

Interpolation; curve; forecasting; Risk Simulator; set of predictions; interest rate; tine-series; marketing expenses; internal stuff members.

VI. Read the description of drawing a circular/low

Start with the first block. It is divided into two – the Quantitative one and the Qualitative one.

The Quantitative technique divides into three – Cross-Sectional which includes Econometric Models, Monte-Carlo Simulation, Multiple Regression and Statistical Probabilities; Mixed panel which includes ARIMA (x) and Multiple Regression and the one in a middle which includes Use Risk Simulator's, Forecast Tool for ARIMA; Classical Decomposition; Multivariate Regressions; Nonlinear Regressions; Simulations and Stochastic Processes.

The Qualitative one includes Delphi Method, Expert Opinions, Management Assumptions, Market Research, Polling Data and Surveys.

Find in the text English equivalents for the following

подписать обозначения на картинке; овал в середине; самый правый прямоугольник.

VII. Answer the questions

1. What forecasting methodologies do you know?
2. With what deals risk management?
3. What does stress analysis include?
4. What is the real value of the up-to-date computers?
5.What is forecasting?
6. In what two ways forecasting can be divided?
7. What is forecast error?
8. Name the types of forecasting techniques.

VIII. Translate using all the active possible

1. Прогноз — это научная модель будущего события, явлений.
2. Интерполяция - способ нахождения промежуточных значений величины
3. Качественные методы включают метод Делфи, мнения экспертов
4. Прогнозирование можно разделить на количественные и качественные подходы.

IX. Make up the dialogue

You are introducing a new line of products and are talking to a business consultant, about it.

UNIT 19 R/S ANALYSIS

R/S analysis has one *significant advantage* compared to the other methods - as it is known and tested for over 50 years, the methods for testing have been *well developed* and applied (Peters, 1991).

The condition for a time series to *reject* long-term dependence is that $H = 0.5$. However, it holds only for infinite samples and therefore is an *asymptotic limit*. The correction for finite samples is thoroughly tested in Couillard & Davison (2005). Anis & Lloyd (1976), which we note AL76, states the expected value of *rescaled range* as

$$E(R/S)_v = \frac{\Gamma(\frac{v-1}{2})}{\sqrt{\pi}\,\Gamma(\frac{v}{2})} \sum \sqrt{\frac{v-i}{i}}$$

Gamma functions r(*) can be used up to $o = 2^8 = 256$ and approximation for higher ones since gamma functions cannot be estimated for high values even by modern analytical software. The approximation is based on relationship between gamma and beta functions together with Stirling's *approximation* so that we get Γ((v-1)/2)/Γ(v/2)=2/(v-1)(Boisvert *et al.,* 2008) to eventually obtain

$$E(R/S)_v = \sqrt{\frac{2}{(v-1)\pi}} \sum \sqrt{\frac{v-i}{i}}$$

We performed original tests for time series lengths from $T = 512 = 2^9$ up to $T = 131072 = 2^{17}$. All steps of R/S analysis on 10000 time series drawn from standardized normal *distribution* N(0,1) were performed. Hurst exponent was estimated by log-log *regression* according to the presented procedure. Averaged rescaled ranges applied in the regression were the ones for $2^4 < o < 2^{t-2}$. The logic behind this step is rather intuitive -very small scales can *bias the estimate* as *standard deviations* are based on very few observations; on the other hand, large scales can bias the estimate as *outliers* or simply extreme values are not averaged out (Peters, 1994; Grech & Mazur, 2004; Matos *et al.,* 2008; Alvarez-Ramirez, Rodriguez & Echeverria, 2005; a Einstein, Wu & Gil, 2001). The same procedure is applied for DFA-1 later.

The expected values of Hurst exponent and corresponding descriptive statistics together with Jarque-Bera test (Jarque & Bera, 1981) for normality are summed in Table 1 and histograms are showed in Chart 1. The estimates of Hurst exponent are not equal to 0.5 as predicted by *asymptotic theory*. Therefore, one must be careful when accepting or rejecting hypotheses about long term dependence present in time series solely on its divergence from 0.5. This statement is most valid for short time series. However, the Jarque-Bera test rejected normality of Hurst exponent estimates for time series lengths of 512, 65536 and 131072 and therefore, we should use percentiles rather than standard deviations for the estimation of confidence intervals (Weron, 2002). Nevertheless, the differences for mentioned estimates not normally distributed are only of the order of the tenths of the thousandth and therefore, we present confidence intervals based on standard deviations for R/S. Standard deviation can be estimated as

with R^2 of 98,55% so that the estimates are very reliable . Therefore, we propose for other time series length but for the same minimum and maximum scales only as the estimates can vary for different scales choice (Peters, 1994; Weron, 2002; and Couillard & Davison, 2005).

VOCABULARY NOTES

significant advantage - значительное преимущество
well developed - хорошо развитый
reject - отвергать
asymptotic limit - асимптотический предел
rescaled range - изменять масштаб

approximation - приближённое выражение
distribution - распределение
regression – регрессия
bias the estimate – влиять на оценку
standard deviations - стандартное отклонение
outliers - постороннее значение
asymptotic theory - асимптотическая теория

*I. Replace the parts in **italics** by synonyms*

R/S analysis has one *significant advantage, t*he condition for a time series to *reject* long-term dependence, one must be careful when *accepting* or rejecting hypotheses about long term dependence, we present confidence intervals based on standard *deviations.*

II. Fill in the gaps -with the words and expressions/ran the text

1. R/S analysis has one _____ advantage compared to the other methods.
2. The condition for a time series to reject _____ dependence is that $H = 0.5$.
3. The approximation is based on relationship between gamma and beta functions together with Stirling's _____
4. Hurst exponent was estimated by log-log ____ according to the presented procedure.
5. The logic behind this step is rather intuitive -very small scales can ____ the estimate as standard ____ are based on very few observations.
6. Therefore, one must be careful when _____ or _____ hypotheses about long term dependence present in time series solely on its _____ from 0.5.

III. Find in the text English equivalents/or the following

значительное преимущество, отклонение, достоверный, уровень, оценивать, разнести, сложить, разница

V. Give explanations in English

significant advantage, well developed, correction, distribution, deviations

IV. Read the description

Financial ratio - mathematical relationship between one quantity and another. There are many categories of ratios such as those that evaluate a business entity's liquidity, solvency, return on investment, operating performance, asset utilization, and market measures. An example of a ratio is the earnings yield that equals dividends per share divided by market price per share. While the computation of a ratio is a basic arithmetical operation, its analytical interpretation is more complex. A financial ratio should be computed only if the relationship between accounts or categories has significance. The financial ratio may provide the accountant with clues and symptoms of underlying financial condition. To be meaningful, a given financial ratio of a company for a given year must be compared to (1) prior years to examine the trend, (2) industry norm, and (3) competing companies.

Find in the text English equivalents for the following

Ликвидность, платёжеспособность, доход на инвестиции, текущая деятельность, коэффициент доходности, вычисление

V. Answer the questions

1. What advantage does R/S analysis have?
2. What is approximation based on?
3. What did Jarque-Bera test reject?
4. Why should one be careful when accepting or rejecting hypotheses?
5. Why is the logic behind that step rather intuitive?

VI. Translate using all the active possible

1. Метод нелинейной динамики имеет одно значительное преимущество перед другими методами, т.к. он известен и проверен на протяжении 50 лет, методы для тестирования были хорошо разработаны и применены.
2. Приближённое выражение основывается на отношении между гамма-функцией и бета-функцией на равне с приближённой формулой Стерлинга.
3. Логичность в этом решении довольно таки интуитивна, очень маленький объем может

влиять на оценку, т.к. стандартное отклонение основано на незначительном количестве наблюдений.

VII. Make up the dialogue

Discuss the conditions for starting new business in public and private sectors.

VIII. Additional exercise

Write an appreciation letter.

UNIT 20 INFORMATION AS AN EXCHANGEABLE GOOD

In economic theory, the natural tendency is to consider any ***exchangeable*** entity as a good. The category of goods has been extended progressively to include ever more immaterial items: first ***labor*** or money, then time or information, finally crime or sex. ***information is*** likewise ***treated*** as some kind of good, even though it exhibits many ***features*** that differentiate it from a material good like a car. information is only partially modular, essentially since it closely links a physical support and a psychical meaning. Obviously, it is possible to define items of information with a fairly independent signification and even to measure their syntactic content in informational quanta (bits). Nevertheless, information is fundamentally holistic, in the sense that different pieces of information are only relevant when they are considered together.

The production of information may be ***obtained*** at various costs. It may be very cheap when it results from a natural observation, or more expensive when obtained by means of a complicated apparatus. But its main characteristic is its '***reproducibility***' once it has been produced.

The ***reproduction cost*** involves no more than the transcription of its content from one material support to another. Concretely, its ***production mode*** depends on the (fixed) costs involved and on the potential users. The production of information is usually public when it concerns global and collectively relevant events (such as meteorological or macroeconomic information). It is likely private when it concerns only local and individually relevant events. Intermediate situations are possible, for instance when public information is ***treated*** in order to adapt it to specific needs.

As concerns its exchange, information may be more or less transferable. It is communicated by means of various material supports, which may be auditory, written, iconic, etc. But its main characteristic is the physical ***irreversibility of exchange***. Once an agent has acquired some information, it is impossible for him to give it back, except through (human or artificial) ***memory failure***. Practically, its transmission depends on the availability of some code shared by the members of an audience. The transmission is public when it uses a common code like natural language, as in general education. It is private when it relies on a specific code, i.e. a shared specialized language, shared background knowledge or shared secret code, as in technical matters. Intermediate situations appear when agents share a common ***vernacular*** or technical ***language***.

As concerns its ***consumption***, information may be relevant at different levels. It may be used to satisfy purely ***intellectual curiosity*** or to prepare strategic decisions. But its main characteristic is the absence of '***rivalry***', since the fact that one agent has already consumed it does not ***preclude*** its consumption by others. It involves profound ***externalities***, even if a certain degree of control can be exerted on it. Consequently, its diffusion depends on natural and artificial barriers erected to protect it. Diffusion is very large when achieved by mass media or the Web. It is more restricted when directed towards a group of initiated and isolated agents. Intermediate situations are possible, for instance when some TV programs are protected by electronic coding devices.

Despite the specific character of information, it can be bought and sold in an information market. In order to ensure a competitive market, its specific features are attenuated by ***auxiliary devices*** or institutions. Free reproduction is forbidden in order to obtain an exclusive good and free diffusion is filtered in order to obtain a good that can be privatized.

Nonetheless, some agents may ***retain*** monopolistic power over the availability of information and heavily distort market conditions, especially with high storage costs. But then some agents may discuss information on alternative circuits and ***re-establish*** competition outside the market.

Finally, every agent makes a trade between first-hand information directly gathered or inferred and second-hand information ***purchased*** on a market. This is especially true for information about the quality of an everyday good, information which is partially reflected in its price. Such an arbitrage may, however, lead to a well known paradox (Grossman, Stiglitz) when nobody initially possesses the information. If somebody buys the information, it is subsequently reflected in the price of the good. Hence, it is in every agent's interest to discover the information from the price, instead of purchasing it directly. However, if everybody does the same thing, nobody has an ***incentive to acquire*** the information in the first place, and it will not be reflected in the price.

The employer and the employee are both interested in outside information produced by professional institutions or personal contacts. Both wish to learn about the economic features of **the labor market** in relation to the availability of workers or the level of wages. The employer also considers the economic conditions of his production sector, as concerns its global activity and the degree of competition. Conversely, the employee looks for more precise information about jobs within

his field of competences and about the labor laws protecting his position. Both agents may be sensitive to the reliability of the source of information, depending on whether or not it is first-hand information.

VOCABULARY NOTES

exchangeable – подлежащий обмену;
labor – труд, рабочая сила;
to treat – обрабатывать, рассматривать (**information is treated** – информация рассматривается);
features – особенности;
to obtain – получать;
reproducibility – воспроизводимость;
reproduction cost – стоимость воспроизводства;
production mode – рабочий режим, режим обработки;
irreversibility of exchange – необратимость обмена;
memory failure – провал памяти;
vernacular language – разговорный язык.
consumption - потребление; затрата;
intellectual curiosity – интеллектуальное любопытство;
rivalry - соперничество; конкуренция;
preclude – препятствовать;
externalities – внешние факторы;
auxiliary device - вспомогательное устройство;
to retain – сохранят;
to re-establish – восстанавливать;
purchase - покупка, приобретение;
incentive - побуждение, стимул;
to acquire - получать, приобретать;
the labor market – рынок труда;

Assignments

I. Suggest the Russian equivalents
Relevant events; the absence of “rivalry”; exchangeable good; to possess the information; the economic features of the labor market; the precise information; immaterial items; to attenuate by auxiliary devices.

*II. Replace the parts in **italics** by synonyms*
Information is likewise *treated* as some kind of good; the agent has *acquired* some information; code is private when it *relies* on a specific; information may be *relevant* at different levels; to *satisfy* purely intellectual curiosity; to *ensure* a competitive market; free reproduction is *forbidden*.

III. Fill in the gaps -with the words and expressions/ran the text
1. The _____ is public when it uses a _____ code like natural language.
2. One agent has already _____ it does not preclude its _____ by others.
3. TV programs are _____ by electronic coding _____.
4. If somebody buys the information, it is subsequently _____ in the price of the _____.
5. Its production mode _____ on the (fixed) _____ involved and on the potential users.
6. The employer also considers the economic _____of his production sector, as _____ its global activity and the degree of _____.
7. The specific character of information, it can be _____ and _____ in an information _____.
8. Some agents may _____ monopolistic power over the _____ of information.
9. It is communicated by means of various material supports, which may be _____, _____, _____, etc.
10. The production of information may be _____ at various costs.

IV. Find in the text English equivalents the following

Затраты на воспроизводство; потребление; ограниченная группа; внешний фактор; фундаментальные знания; получение информации; передача информации; отражаться в цене; степень конкурентноспособности.

V. Give explanations in English

The memory failure; the externalities; the availability of information; the first-hand information; be reflected in the price; the economic conditions; communication; reproducibility.

VI. Answer the questions

1. What is mean the physical irreversibility of exchange for information?
2. What do you think, where do people use the private and public transmission of information?
3. What is the main characteristic of information? What is it mean?
4. What do you know about specific character of information?
5. What information about condition of work should employee know to apply for a job?

VII. Translate using all the active possible

1.Информация может быть использована для удовлетворения интеллектуальной потребности или для принятия стратегических решений.

2.Информация, как товар, имеет особое свойство – при её продаже она не покидает своего владельца.

3.Расходы на получение информации бывают разными, расходы могут быть не большими, если это связано с природными наблюдениями, или более дорогими, когда информация получена с помощью сложной аппаратуры.

4.Если ценная и своевременная информация выражена непонятным образом, она может стать бесполезной.

VIII. Make up the dialogue

You are going to take a loan. Ask an experienced person how to do it.

IX. Additional exercise

You want to apply for a job and place information about you on website. Write about you, your experience and your education.

UNIT 21 INFORMATION SYSTEMS

The term *information system* refers to information technology that is used by people to accomplish a specified organizational or individual objective. The technology may be used in the gathering, processing, storing, and/or dissemination of information. The specific technologies that collectively comprise information technology are *computer technology* and *data communications technology*.

Advances in computer hardware, software, and networking technologies have spurred an evolution in the structure, design, and use of corporate information systems.

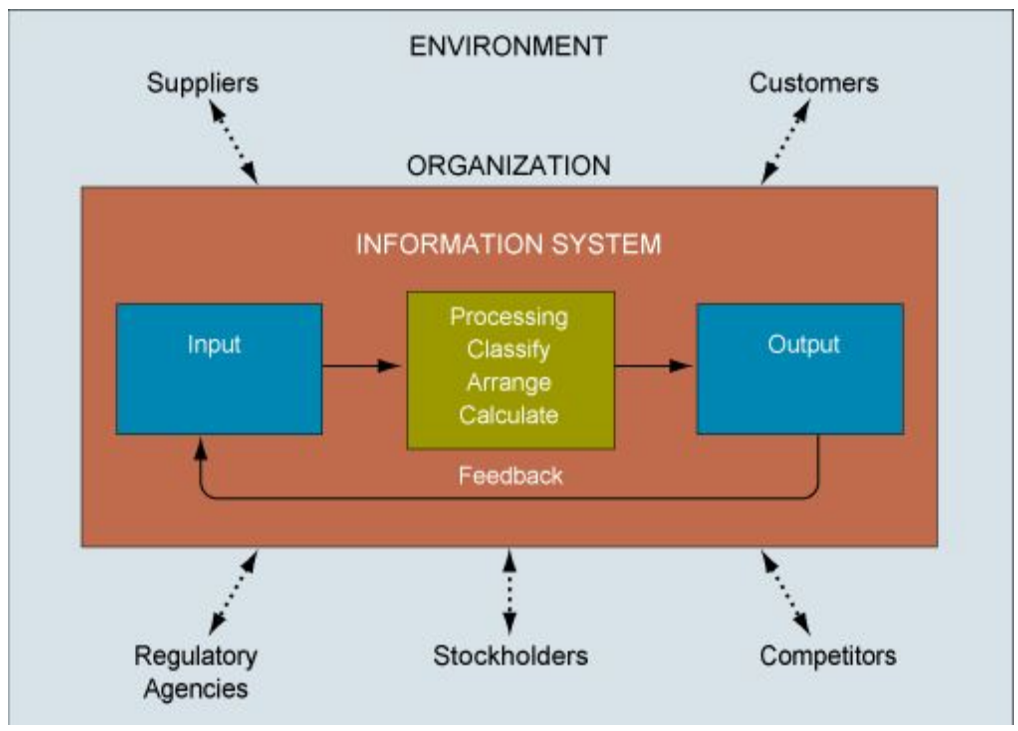


Figure 1 - Functions of an information system

When computers first began moving into the business world the computing environment was best described as *centralized, host-based computing*. In this environment, the typical organization had a large *mainframe computer* connected to a number of "dumb". The mainframe did all the data processing for all the user terminals connected to it.

Smaller than the mainframe, the minicomputer ushered in the era of *distributed data processing* (DDP). In this new processing environment, an organization could connect one or more minicomputers to its mainframe. Thus, the organization's data-processing function was no longer localized in a single, centralized computer but, rather, *distributed* among all the computers.

The commercial introduction of the personal computer by IBM in the early 1980s revolutionized organizational data processing. The personal computer brought data processing to the desktop.

It is important to note that, despite their proliferation and ubiquity, personal computers have *not* replaced minicomputers or mainframes.

Computer software is the set of programs and associated data that drive the computer hardware to do the things that it does. Software typically comes in one of two forms: *custom-written application programs* or *off-the-shelf software packages*. Custom-written application programs are usually written by an organization's own programming team or by professional contract programmers to satisfy unique organizational requirements. Off-the-shelf software packages are produced by software development companies and made commercially available to the public.

Application software is designed to more directly help human users in the performance of their specific job responsibilities.

One of the very important information systems functions is *systems analysis and design*, that is, analyzing a client's business situation (or problem), with respect to information processing, and designing and implementing an appropriate solution to the problem.

Transaction processing systems: This helps managers at the day-to-day operational level keep track of daily transactions as well as make decisions on when to place orders, make shipments, and so on.

Management information and reporting systems: These systems provide mid-level and senior managers with periodic, often summarized, reports that help them assess and make appropriate decisions based on that information.

Decision support systems: These systems are designed to help mid-level and senior managers make those difficult decisions about which not every relevant parameter is known. Group decision support systems (*GDSS*) help groups (as opposed to individuals) to make consensus-based decisions.

A type of decision support system that is geared primarily toward high-level senior managers is the *executive information system* (EIS) or *executive support system* (ESS). It is designed primarily to help executives keep track of a few selected items that are critical to their day-to-day high-level decisions.

Expert systems: An expert system is built by modeling into the computer the thought processes and decision-making heuristics of a recognized expert in a particular field. That is, to help a human decision maker arrive at a reasonable decision, rather than to actually *make* the decision for the user.

Together with computer technology, data communications technology has had a very significant impact on organizational information processing. There have been tremendous increases in the bandwidths of all data communications media. Wide area networks (WANs) provide access to remote computers and databases, thus enabling organizations to gain access to global markets, as well as increase their information sources for decision making purposes. The Internet in particular— the worldwide network of computer networks — has greatly facilitated this globalization phenomenon. This greatly facilitates organizational communication and decision-making processes.

The combination of computer and networking technologies has also changed the way basic work is done in many organizations. For example, *telecommuting* and *virtual offices* are commonplace in several organizations. These practices are made possible through modem-equipped computers that can access a remote computer (the office computer) via a data communications network.

An organization's overall performance can be greatly enhanced by strategically planning for, and implementing, information systems that optimize the inherent benefits of information technology to the benefit of the organization.

VOCABULARY NOTES

- dissemination of information - распространение информации
- to comprise - охватывать
- data communications technology - технологии обмена данными
- host-based computing - хост-ориентированные вычисления
- *distributed data processing* - распределённая обработка данных
- desktop - настольный компьютер
- proliferation - распространение
- ubiquity - повсеместность
- off-the-shelf software packages - готовые программные пакеты
- From a software perspective - с точки зрения программного обеспечения
- *systems analysis and design* - системый анализ и проектирование
- Transaction processing systems - системы обработки транзакций
- semi structured decisions - полуструктурированные решения
- *executive information system* - информационная системы руководящего персонала
- executive support system - система исполнительной поддержки
- keep track of - отслеживать
- bandwidth - полоса пропускания (пропускная способность)
- fiber-optic - оптико-волокно
- microwave transmission - микроволновая передача данных
- globalization phenomenon - феномен глобализации
- commonplace - банальность
- managerial decisions - управленческие решения
- modem-equipped - оснащённый модемом
- optimize inherent benefits - присущие оптимизации выгоды

ASSIGNMENTS

I. Suggest the Russian equivalents

- provide an individual objective.
- mean of the centralized computing
- data *distributed* among all the computers
- organizational data processing
- personal computers compatible with the IBM PC
- all-inclusive term *microcomputer*
- encompass all makes and models of desktop computers
- rely on larger computers for significant aspects

*II. Replace the parts in **italics** by synonyms*

- The specific technologies that collectively ***comprise*** information technology.
- When computers first began ***moving*** into the business world …
- Centralized host connected to a number of "dumb" terminals ***scattered*** throughout the organization.
- The personal computer ***carried*** the distributed processing concept even further within organizations.

III. Fill in the gaps - with the words and expressions/ran the text

1. _____ _____ _____ Limited provide the software tools and expertise to help with business process management.
2. _____ _____ is computing done at a central location, using terminals that are attached to a central computer.
3. A _____ _____ consists of multiple autonomous computers that communicate through a computer network.
4. A _____ is a computer with a microprocessor as its central processing unit.
5. _____ _____ is computer software designed to help the user to perform singular or multiple related specific tasks.
6. _____ _____ can be regarded as the mental processes (cognitive process) resulting in the selection of a course of action among several alternatives. Every _____ _____ process produces a final choice.
7. _____ _____ is the study of systems — sets of interacting entities, including computer systems.
8. _____ _____ is the process or art of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements.
9. Each _____ must succeed or fail as a complete unit; it cannot remain in an intermediate state.
10. _____ _____ _____ are regarded to be a subset of the overall internal controls procedures in a business, which cover the application of people, documents, technologies, and procedures used by management accountants to solve business problems such as costing a product, service or a business-wide strategy.
11. _____ _____ _____ serve the management level of the organization and help to take decisions, which may be rapidly changing and not easily specified in advance.
12. An _____ _____ _____ is a type of management information system intended to facilitate and support the information and decision-making needs of senior executives by providing easy access to both internal and external information relevant to meeting the strategic goals of the organization.

IV. Find in the text English equivalents/or the following

- Осуществлять указанные организационные (цели организации) или личные цели.
- Специализированные технологии, которые вместе обобщают информационные технологии, - компьютерные технологии и технологии передачи данных.
- Терминалы такого типа именуются "глупыми" из-за отсутствия "родного интеллекта".
- Они позволили организовать обработку данных на настольные компьютеры.
- Все охватывающий термин "настольный компьютер" иногда используется для обобщения компьютеров всех моделей от всех производителей.

- Программное обеспечение - набор программ и связанных данных.
- Готовые программные продукты.
- Готовые программы коммерчески доступны для публики.
- Процесс начинается с выяснения детальных информационных требований клиентов и бизнес процессов.

V. Give explanations in English

- Most of the storage and processing capabilities,
- remote access of information,
- To spur an evolution in the structure,
- built-in central processing unit,
- the mainframe in corporate headquarters,
- The commercial introduction of,
- To carry a concept within organization,
- An all-inclusive term,
- Aspects of their day-to-day operations,
- Custom-written application programs.

VI. Read the description of drawing a circular/low

An information system contains information about an organization and its surrounding environment. Three basic activities—input, processing, and output—produce the information organizations need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Environmental actors such as customers, suppliers, competitors, stockholders, and regulatory agencies interact with the organization and its information systems.

VII. Find in the text English equivalents for the following

- Технология может использоваться для сбора, обработки, размещения и распространения информации.
- Наработки в области аппаратного, программного обеспечения, сетевых технологиях подстегнули прогресс.
- В основе типичной структуры находится мейнфрейм, соединённый с "глупыми" терминалами.
- Телекоммуникации и виртуальные офисы - обыденность во многих организациях.
- Производительность организации в целом может быть повышена стратегическим планированием и реализацией информационных систем.

VIII. Answer the questions

- What specific technologies does the term of information technologies include?
- What was the reason of evolution of information systems implementation?
- Why do terminals called "dumb" with regard to mainframe?
- What are the key concepts of distributed data processing?
- Who brought distributed data processing to the desktop?
- What does the term computer software covers?
- What are 2 forms of computer software distribution? What are the differences between those forms?
- What are the most important functions of information systems?

IIX. Translate using all the active possible

1. Информационные технологии охватывают специфические технологии: компьютерные технологии и технологии передачи данных.
2. Мейнфрейм осуществляет всю обработку данных для подключённых к нему терминалов.
3. Персональный компьютер привнёс концепцию распределённой обработки данных в организации.
4. Обычно программное обеспечение поставляется в одной из двух форм: самостоятельно

написанные и готовые к немедленному использованию программные пакеты.

IX. Make up the dialogue

You are a customer of a developer company that implements an information system. Discuss high-level requirements for the desired information system you want to get.

X. Additional exercise

Imagine an organization with a CEO in your face. Provide a description of corporate information system and its sub-parts.

UNIT 22 MANAGEMENT INFORMATION SYSTEMS

A management information system (MIS) is a system or process that provides the information necessary to manage an organization effectively. MIS and the information it generates are generally considered essential components of prudent and reasonable business decisions.

MIS as System: MIS is a system, which makes available the right information to the right person at the right place, at the right time, in the right form & at the right cost.

Management information systems are those systems that allow managers to make decisions for the successful operation of businesses. Management information systems consist of computer resources, people, and procedures used in the modern business enterprise. The term MIS stands for management information systems. MIS also refers to the organization that develops and maintains most or all of the computer systems in the enterprise so that managers can make decisions. The goal of the MIS organization is to deliver information systems to the various levels of corporate managers. MIS professionals create and support the computer system throughout the company. Trained and educated to work with corporate computer systems, these professionals are responsible in some way for nearly all of the computers, from the largest mainframe to the desktop and portable PCs.

MIS managers are in charge of the systems development operations for their firm. Systems development requires four stages when developing a system for any phase of the organization:

Phase I is systems planning. The systems team must investigate the initial problem by determining what the problem is and developing a feasibility study for management to review.

Phase II identifies the requirements for the systems. It includes the systems analysis, the user requirements, necessary hardware and software, and a conceptional design for the system. Top management then reviews the systems analysis and design.

Phase III involves the development of the systems. This involves developing technical support and technical specifications, reviewing users' procedures control, designing the system, testing the system, and providing user training for the system. At this time, management again reviews and decides on whether to implement the system.

Phase IV is the implementation of the system. The new system is converted from the old system, and the new system is implemented and then refined. There must then be ongoing maintenance and reevaluation of the system to see if it continues to meet the needs of the business.

An institution's MIS should be designed to achieve the following goals:

- Enhance communication among employees.
- Deliver complex material throughout the institution.
- Provide an objective system for recording and aggregating information.
- Reduce expenses related to labor-intensive manual activities.
- Support the organization's strategic goals and direction.

Effective MIS should ensure the appropriate presentation formats and time frames required by operations and senior management are met. MIS can be maintained and developed by either manual or automated systems or a combination of both. It should always be sufficient to meet an institution's unique business goals and objectives. The effective deliveries of an institution's products and services are supported by the MIS. These systems should be accessible and useable at all appropriate levels of the organization.

MIS is a critical component of the institution's overall risk management strategy. MIS supports management's ability to perform such reviews. MIS should be used to recognize, monitor, measure, limit, and manage risks. Risk management involves four main elements:

- Policies or practices.
- Operational processes.
- Staff and management.
- Feedback devices.

Computer-based or manual system that transforms data into information useful in the support of decision making. MIS can be classified as performing three functions:

1. To generate reports-for example, financial statements, inventory status reports, or performance reports needed for routine or non-routine purposes.

2. To answer what-if questions asked by management. For example, questions such as "What would happen to cash flow if the company changes its credit term for its customers?" can be answered by MIS. This type of MIS can be called Simulation.

3. To support decision making. This type of MIS is appropriately called Decision Support System (DSS). DSS attempts to integrate the decision maker, the data base, and the quantitative models being used.

VOCABULARY NOTES

essential components – основные компоненты
modern business enterprise – современное предпринимательство
mainframe – центральный процессор
systems development – системы развития
investigate the initial problem – исследование существующей проблемы
feasibility – вероятность
conceptional design – концептуальная разработка
review – обзор
implement the system – внедрение системы
ongoing maintenance – текущее обслуживание
enhance communication – улучшение взаимодействия
recording and aggregating information – регистрации и сбора информации
reduce expenses related to labor-intensive manual activities – сокращение расходов, связанных с трудоемкой ручной деятельностью
senior management – высшее руководство
accessible and useable – доступный и полезный
overall risk management – общее управление рисками
feedback devices – устройства обратной связи
routine or non-routine purposes – плановые и внеплановые цели
cash flow – денежный поток
credit term – срок кредита
simulation – моделирование
appropriately – соответственно
quantitative models – количественные модели

Assignments

I. Suggest the Russian equivalents

A management information system, reasonable business decisions, successful operation of businesses, management accountants, project management and database retrieval application.

II. Fill in the gaps -with the words and expressions/ran the text

1. A management information system (MIS) is a system or _____ that provides the _____ necessary to manage an organization effectively.
2. MIS is a system, which makes available the right information to the right person at the right , at the right _____, in the right _____ & at the right _____
3. Management information systems consist of computer _____, people, and _____ used in the modern business enterprise
4. MIS managers are in charge of the _____ _____ operations for their firm
5. The systems team must ___ the initial problem by determining what the problem is and _____ a feasibility study for management to review
6. Development of the systems involves developing technical and technical , reviewing users' procedures control, designing the system, testing the system, and providing user training for the system.
7. MIS can be maintained and developed by either ____ or ___ systems or a combination of both.
8. MIS should be used to recognize, , , limit, and manage risks.
9. Computer-based or _____ _____ that transforms data into information useful in the support of decision making.

10. To generate reports-for example, financial statements, inventory status reports, or performance reports needed for ___ or ___ purposes.

III. Find in the text English equivalents/or the following

Принятие решений, успешная работа предприятия, системное планирование, определение требований к системе, внедрение системы, финансовая отчетность, тестирование системы, разработка системы, современное предпринимательство, общее управление рисками.

IV. Give explanations in English

Management information systems, business decisions, employee, feedback devices, manage risks.

V. Translate using all the active possible

1. Система управления информацией (MIS) представляет собой систему или процесс, который содержит информацию, необходимая для эффективного управления организацией.
2. Целью организации MIS является предоставление информационных систем для различных уровней корпоративных менеджеров.
3. MIS руководители несут ответственность за деятельность по разработке систем для их фирмы.
4. Новая система конвертируется со старой системы и новая система будет внедряться и затем совершенствоваться.
5. MIS является одним из важнейших компонентов общей стратегии управления рисками.

VI. Answer the questions

1. What is mean MIS?
2. What are the management information systems in an organization?
3. What are the four stages when developing a system for any phase of the organization?
4. What are the advantages of Management Information System?
5. Fundamental goals of MIS.
6. Four main elements of risk management.

VII. Translate using all the active possible

Экономическая кибернетика занимается приложением идей и методов кибернетики к экономическим системам. Под словами экономическая кибернетика понимают область науки, включающая математическое программирование, исследование операций, экономико-математические модели, эконометрику и математическую экономику. Экономическая кибернетека рассматривает экономику, а также её структурные и функциональные части как сложные системы, в которых протекают процессы регулирования и управления.

application ideas – приложение идей
arise – возникать
operations research – исследование операций
Econometrics – эконометрика
structural parts – структурные части
functional parts – функциональные части
regulation – регулирование
management – управление

VIII. Additional exercise

Write a formal letter about work placement.

IX. Additional exercise. Answer these questions

What is the difference in meaning between these words?

- an employer/an employee
- an interviewer/an interviewee
- an application form/a CV
- experience/qualifications
- a salary/a bonus
- a managing director/a sales rep.

What must you do to be successful in a job interview?

UNIT 23 THE RISE OF DATA WAREHOUSES

A recent response to the proliferation of corporate data across differing organizational database systems has been the idea of the *data warehouse*. In this emerging fusion of database and application control processes., corporate Resources are united under a single integrated structure. Figure 1 illustrates a simple data warehouse. Just a few years ago, each corporate division or government agency created and administered its own databases. Discussions about database systems nearly always centered around the organization of data rather than the uniform integrity and sharability of data and the use of corporate data resources to discover interesting trends and movements in the outside world. Today, these discussions almost always begin with the concept of a centralized data repository, the data warehouse. Data warehouses are corporate- or agency-wide consolidations of an organization's operational data. They enforce common methods of key decision and representation, domain integrity checks, and data validity management. As Figure 1 pointed out, the warehouse makes an explicit commitment to the uniform management of diverse data elements, integrating principal information repositories to create a structure representing a single, well-behaved and well-defined interface for each type of user in each of the organization's business elements. It is this consistent and uniform approach to data management that delivers a wide array of benefits to the organization. One of the collateral benefits of a data warehouse is the opportunity it affords to perform wide-ranging queries on the organization's fundamental data.

Yet this consolidation of corporate resources into a central data warehouse need not imply that the warehouse is a monolithic entity, physically located and physically administered by a central information technology (IT). In many organizations, the data warehouse has been profoundly influenced by the emerging age of distributed knowledge. These formal methodologies, aimed at creating and maintaining a competitive edge, rely on the security and integrity of information. As we discussed previously, a consideration of these objectives has seen the rapid rise of the centralized data warehouse. But, as corporations and government agencies steadily move toward a consolidation of their data assets in data warehouse and data mart architectures the simple availability of vast amounts of readily accessible data coupled with ever-faster gigahertz desktop computers will drive an accelerated push toward deeper and broader forms of analysis. Conventional off-line data mining using historical data will give way to high-speed on-line analytical processing (OLAP).

Perhaps a larger problem facing management is the synthesis of information into an adaptable knowledge base. Using this knowledge base, an organization can construct and connect an entire suite of cooperative and synergistic business process models. These models share information and support their conclusions through an accumulation of evidence only possible when they have access to the company's complete information framework. How to build these models and what technology should be used are common themes in distributed data warehouse projects.

Throughout this book we look at an approach that combines several computational intelligence techniques. Fundamentally, after examining fuzzy database queries and fuzzy cluster analysis we look at the use of fuzzy rule induction in the building of business process models.

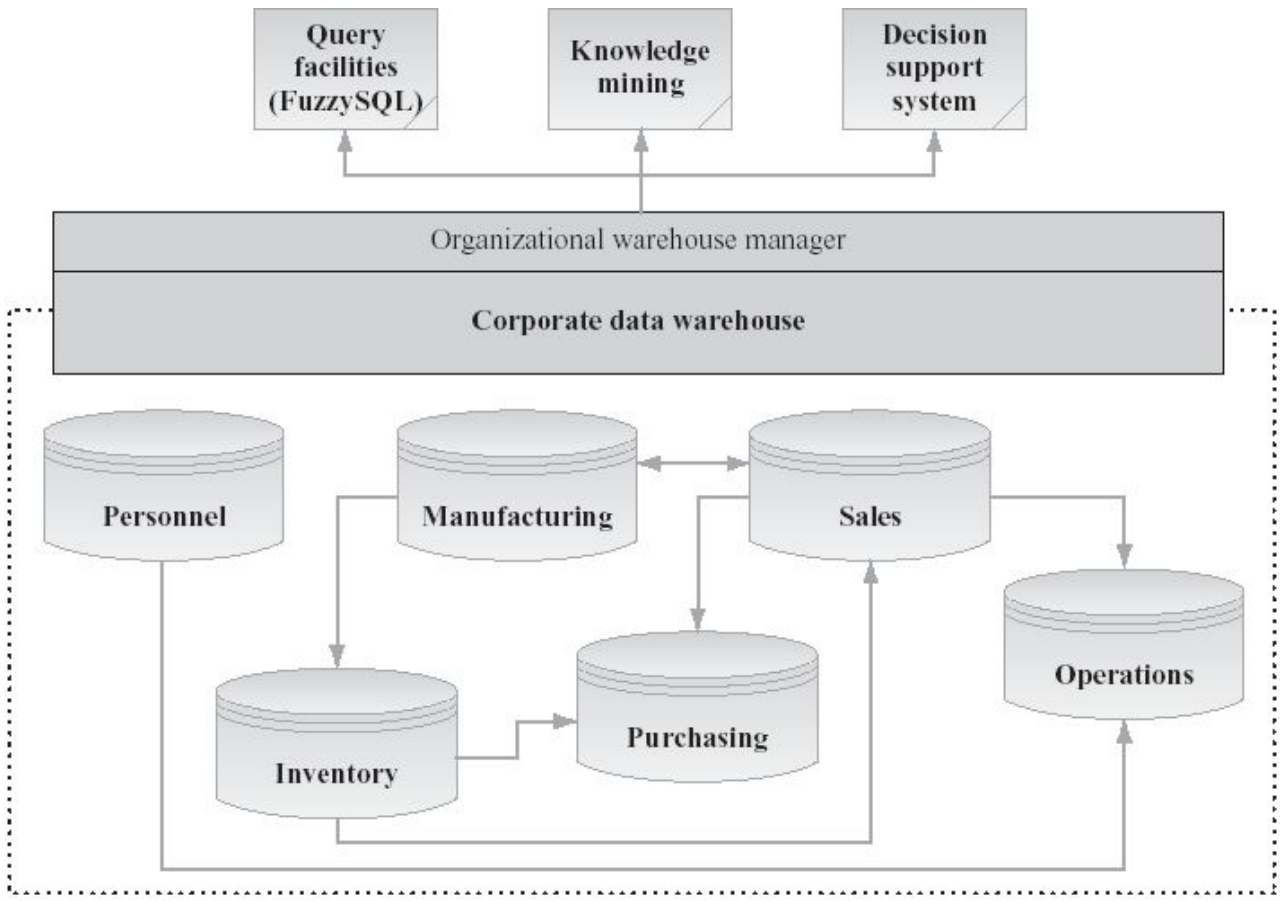


Figure 1. A simple data warehouse organization

VOCABULARY NOTES

Response - реакция, ответ, отклик.
Proliferation - распространеие
Division - деление, разделение распределение
Data Warehouses - хранилище данных
fusion of database - интеграция базы данных
sharable data - данные для совместного использования
data repository - хранилище данных
steadily - монотонно
key decision - основное решение
assets - активы
off-line data processing - автономная обработка данных
historical data - ретроспективные данные
monolithic entity - единый объект
knowledge mining - знания горной промышленности
Decision Support System - система поддержки принятия решений
query facilities - средства обеспечения запросов, средства организации запросного режима
data mart = datamart киоск [витрина] данных подмножество хранилища данных, организованное для решения аналитических задач конкретного подразделения фирмы (т.е. по одному из направлений её деятельности) или конкретных пользователей

Assignments

I. Suggest the Russian equivalents

Data Warehouses; after examining fuzzy database queries and fuzzy cluster analysis we look at the use of fuzzy rule induction in the building of business process models; OLAP; to give smb. the benefit of one's experience and knowledge; ever-faster computer

II. Replace the parts in italics by synonyms

has seen the rapid rise of the centralized data warehouse; As we discussed previously; These formal methodologies, aimed at creating; Perhaps a larger problem facing management.

III. Fill in the gaps -with the words and expressions/ran the text

1)Throughout ____ book we look at an _____ that combines several computational intelligence techniques
2) ever-faster gigahertz desktop _____
3) after examining _____ database queries and _____ cluster analysis we look at
4) In many organizations, the data_____ has been profoundly
5) application _____ processes
6) But, as corporations and _____ _____ steadily move toward a _____
7) _____ Support System
8) physically _____ and physically _____ by a central information technology
8) off-line _____ processing
9) administered by a central _____technology
10) How ___ _____these models and ____ technology ____ be used

IV. Find in the text English equivalents/or the following

система поддержки принятия решений, нечеткий кластерный анализ, целостность информации, недавний ответ, склад данных, монотонно двигаться к будущему объединению, предназначены для создания и поддержания, выгода, фактор, государство, виртуальная сеть.

V. Give explanations in English

OLAP, Decision Support System, data repository, data mart, virtual network, off-line data processing.

VI. Find in the text English equivalents for the following

Построении моделей бизнес процесса, метод индукции, используя ретроспективные данные, легкоприспособляемая база знаний, посредством накопления фактов, соединять целый набор, распространенные темы проектов.

VI. Answer the questions

1. Which kinds of discussions are always centered around the organization of data?
2. What's a data warehouse? What does it make?
3. What is the idea of centralizing data warehouse?
4. What are traditional business activities?
5. What is the aim of these formal methodologies?
6. What will give way using historical dates?
7. What's the main problem facing management?

VII. Translate using all the active possible

1) оперативный анализ данных для поддержки принятия важных решений. Исходные данные для анализа представлены в виде многомерного куба, по которому можно получать нужные разрезы - отчёты.

2) системы поддержки принятия решений ПО, помогающее при принятии решений

3) используя эту базу организация может конструировать и соединять целый набор объединенных и синергичных моделей бизнес процессов.

VIII Make up the dialogue

Tell your partner everything what you know about data warehouses.

UNIT 24 ENTERPRISE APPLICATIONS AND ANALYSIS MODELS

Modern businesses are increasingly moving into electronic commerce by establishing a presence on the World Wide Web (the Internet). And through the use of private networks and internal corporate networks (intranets), they are applying powerful modeling techniques to such activities as customer relations and supply chain management. Thus, through this on-line presence (their e-commerce portal) they not only conduct business-to-consumer (B2C) but an ever increasing amount of business-to-business (B2B) activities.

Modern corporations and government agencies rely on their increasingly distributed computer infrastructures — application, web, and database servers, as well as routers, load balancers, and firewalls — to support a broad and often unpredictable scope of clients and applications. In the modern interconnected world, the infrastructure is the backbone of the organization's mission capabilities; that is, the enterprise's local and distributed infrastructure is intimately and ineluctably tied to business strategy decisions. Further, the quality of these decisions is based on a reliable and sound application of business intelligence. The organization of an enterprise's application framework extends across a wide array of data repositories, application servers, and web servers.

These application services and models are connected through the machinery of distributed architectures. This distributed architecture consists of several parts,

- the HTTP (Hyper Text Transfer Protocol),
- server pages—such as ASP (Application Server Pages) and JSP (Java Server Pages) that deliver visual structure to the client as well as accept and display information,
- and the transaction message handlers (as well as general message services such as JMS—the Java Messaging System) that move packets of data around the network.

B2B opportunities in the Internet world establish lines of communication between business peers on the Web. Capitalizing on the opportunities in this world means leveraging knowledge and marketplace intelligence at ever accelerating rates. This has driven corporations into a race to build and use advanced computational models derived from sophisticated data mining and machine learning capabilities. In this scenario, businesses encapsulate organizational intelligence from transaction streams associated with the e-business interface and the brick-and-mortar sales interface (the combined points-of-sale interface) thus integrating all aspects of their business into a coherent and effective model.

As Figure 1 illustrates, both strategic and line-of-business (LOB) models have a tight connection with an organization's computer resources. In most enterprises these models work together in a feedback loop that measures the impact of decisions at many levels of the organization. Strategic models are created by integrating information from the organization's various lines of business (or agency bureaus) with information about incoming performance along the supply chain from raw materials and service vendors of. A strategic model, tied to the enterprise's mission and vision, both measures how well the organization is meeting its overall objectives (usually related to bottom-line profits) and predicts the organization's near-term future behavior for these objectives. Income or after-tax cash flow funds the various lines of business, which in turn generally have their own predictive models. Growth predictions (or agency requirements for managing expanded oversight and regulatory demands) fuel requirements for investment funds to support and sustain growth.

Building these decision models involves a fusion of subject matter expertise and models drawn from historical and operational repositories. These historical models often take the form of free-form database searches using a database query language and of rule-based models derived from patterns buried deep in the data itself. The application of data mining in distributed systems is often facilitated by two related but often conflicting trends. The first trend is the consolidation of corporate information into a centrally managed and centrally controlled set of databases known collectively as the Data Warehouse. The second trend is the consolidation of line of business, geographically related, or functionally related business information into locally managed and locally controlled databases. These local repositories are known as Data Marts. In many organizations a loosely connected set of data marts, sharing data over a private or public network, form the organization's data warehouse.

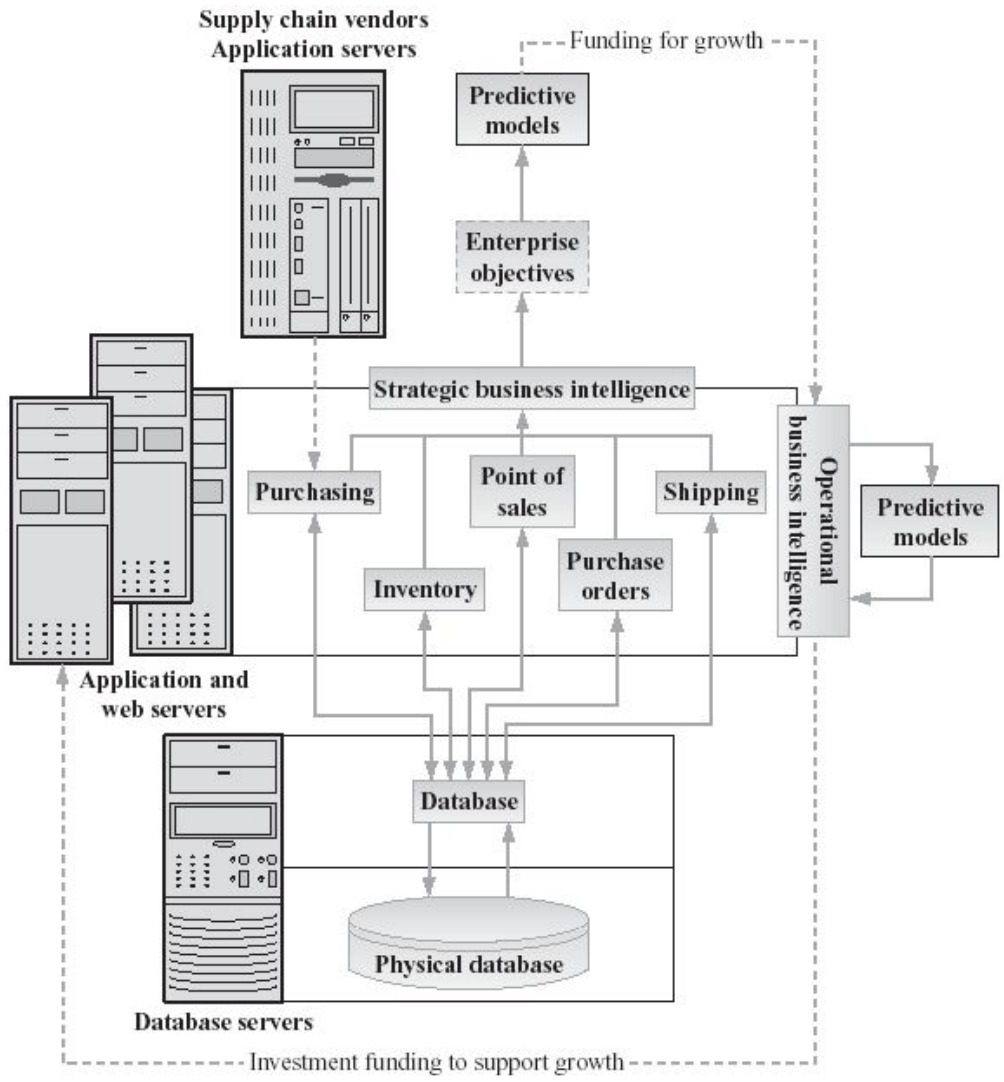


Figure 1. Modeling strategic and operational processes

VOCABULARY NOTES

modeling techniques – методики моделирования;
customer relations – связи с потребителями
supply chain management – управление поставками
distributed computer infrastructure – распределённая компьютерная инфраструктура
backbone – опора;
intimately – тесно;
ineluctably – неизбежно;
business intelligence – интеллектуальные ресурсы предприятия;
application services – программно-аппаратные ресурсы;
the machinery of distributed architectures – механизм распределённой архитектуры;
peers – равноправные участники/узлы сети;
marketplace intelligence – рыночная информация;
rates – цены, ставки;
computational model – вычислительная модель;
sophisticated data mining – сложный анализ данных;
machine learning capabilities – машинная способность к обучению;
feedback loop – цепь обратной связи;
supply chain - канал поставок;
service vendors – служба продаж;
cash flow - движение денежной наличности, денежный поток;
in turn – по очереди;
predictive model - прогнозирующая модель;
requirements – требования;
subject matter – сущность;
operational repository – оперативное хранилище;
data warehouse - хранилище данных - очень большая предметно-ориентированная информационная корпоративная база данных, предназначенная для подготовки отчётов, анализа бизнес-процессов и поддержки принятия решений (DDS). Строится на базе клиент-серверной архитектуры, РСУБД и утилит поддержки принятия решений. Данные, поступающие в

хранилище данных, становятся доступны только для чтения.
data mart - киоск данных - подмножество хранилища данных, организованное для решения аналитических задач конкретного подразделения фирмы (т.е. по одному из направлений её деятельности) или конкретных пользователей.

Assignments

I. Suggest the Russian equivalents
are increasingly moving; through the use of private networks; unpredictable scope of clients; to drive into a race; the distributed nature of data warehouses; a loosely connected set of data marts; to encapsulate organizational intelligence
*II. Replace the parts in **italics** by synonyms*
figure *displays* both strategic and line-of-business (LOB) models; modern corporations and government agencies *hope* on their increasingly distributed computer infrastructures; infrastructure is intimately and ineluctably *connected with* business strategy decisions

III. Fill in the gaps -with the words and expressions/ran the text
1. Thus, _____ this on-line presence (their e-commerce portal) they not only _____ business-to-consumer (B2C) but an ever increasing _____ of business-to-business (B2B) activities.
2. In the modern _____ world, the infrastructure is the _____ of the organization's _____ capabilities.
3. The quality of these decisions is based on a _____ and _____ application of business intelligence.
4. These _____ services and models are connected through the _____ of distributed architectures.
5. Capitalizing on the opportunities in this world means _____ knowledge and marketplace _____ at ever accelerating rates.
6. This has driven corporations into a _____ to build and use advanced computational _____ .
7. Strategic models are created by _____ information from the organization's various _____ of business.
8. Income or _____ cash flow funds the various lines of business, which in turn generally have their own _____ models
9. Building these decision models involves a _____ of subject matter expertise and models drawn from _____ and _____ repositories.
10. The application of _____ in distributed systems is often facilitated by two _____ but often conflicting trends

IV. Find in the text English equivalents/or the following
современный бизнес; частные сети; правительственная организация; сфера клиентов; взаимосвязанный мир; хранилище данных; сервер приложений; вычислительные модели; сложный анализ данных; цепь обратной связи; сущность; язык запросов базы данных; модели основанные на правилах; стратегические модели.

V. Give explanations in English
Data Warehouse; Data Marts; business-to-consumer (B2C) and business-to-business (B2B) activities; business intelligence; distributed computer infrastructures.

VII. Answer the questions
1. Why are companies applying powerful modeling techniques?
2. What do modern corporations and government agencies rely on?
3. From what parts does distributed architecture consist?
4. What does figure 1.3 illustrate?
5. What does strategic model predict?

VIII. Translate using all the active possible
1. Приложение извлечения данных в распределённых системах часто облегчаются двумя связанными, но часто конфликтующими трендами.

2. Локальная и распределённая ин инфраструктура предприятия тесно и неизбежно связана со стратегией принятия бизнесс решений.
3. Во многих организациях свободно связанные наборы киосков данных, распространяют данные через частные и общедоступные сети из хранилища данных организации.

IX. Make up the dialogue
You are going to start your internet shop. Ask a lawyer or an experienced person what documents do you need.

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