

APPENDIX

EXALP was built with `python 2.7` under `Ubuntu 16.04`

A Dependencies and requirements

EXALP has a number of dependencies which need to be installed in order to run EXALP successfully. The final outcome should have the structure as in Fig. 1.

A.1 Unitex/GramLab

- Install Unitex/GramLab according to your OS.
<http://unitexgramlab.org/>
- Install `python` bindings for Unitex/Gramlab.
<https://github.com/patwat/python-unitex>
- Compile grammars for languages you want to use.
For example:
`./Unitex-GramLab-3.1/App/UnitexToolLogger ./Unitex-GramLab-3.1/French/Graphs/Preprocessing/SentenceGrf2Fst2.grf`
- For additional modifications consult Unitex's manual:
<http://www.cis.uni-muenchen.de/people/lg3/ManuelUnitex.pdf>

A.2 hunalign

- Install `hunalign`
<https://github.com/danielvarga/hunalign>
- Dictionaries can be modified in
`cd ./hunalign-1.1/data`
- To run `hunalign` outside EXALP:
 - Show the result as text, no realignment
`hunalign -text dictionary.dic L1.txt L2.txt > result.txt`
 - Use realignment
`hunalign -text -realign dictionary.dic L1.txt L2.txt > result.txt`
- Dictionary argument is obligatory, if you don't want to use it, enter `null.dic`
- For additional options consult
<https://github.com/danielvarga/hunalign>

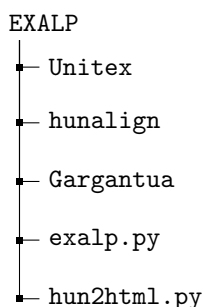


Figure 1: EXALP's environment

A.3 Gargantua

- Download Gargantua from <https://sourceforge.net/projects/gargantua/>
- Follow the README, but skip the part with data preparation - only the aligner is needed
- Prepare the filesystem accordingly (!important!) — All the files in all of the folders in the filesystem should have the same name
- Compile the source code

```
cd src
make clean
make
```
- To run Gargantua outside EXALP, use only `./sentence-aligner`

A.4 Requirements

```
adium-theme-ubuntu==0.3.4
argcomplete==1.8.2
asn1crypto==0.22.0
attrs==17.2.0
Automat==0.6.0
beautifulsoup4==4.5.3
cffi==1.10.0
chardet==2.3.0
constantly==15.1.0
cryptography==2.0
cssselect==1.0.1
docx2txt==0.6
EbookLib==0.15
enum34==1.1.6
fuzzywuzzy==0.15.1
hyperlink==17.3.0
idna==2.5
incremental==17.5.0
ipaddress==1.0.18
langid==1.1.6
lxml==3.8.0
nltk==3.2.4
numpy==1.13.1
olefile==0.44
pdfminer==20140328
Pillow==4.2.1
pocketsphinx==0.1.3
pyparser==2.18
pyOpenSSL==17.2.0
PyPDF2==1.26.0
Pyste==0.9.10
python-Levenshtein==0.12.0
python-pptx==0.6.5
PyYAML==3.11
Scrapy==0.16.0
six==1.10.0
SpeechRecognition==3.6.3
textract==1.6.1
Twisted==17.5.0
unitex==1.0
unity-lens-photos==1.0
w3lib==1.17.0
warc==0.2.1
xlrd==1.0.0
XlsxWriter==0.9.8
zope.interface==4.4.2
```

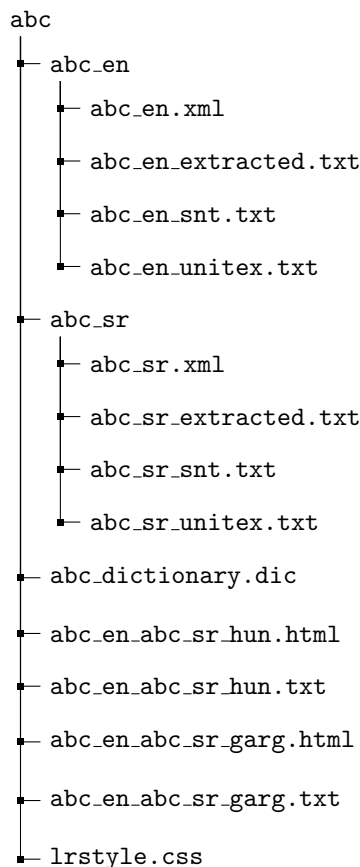


Figure 2: EXALP’s output as a structure of folders

B EXALP

- Arguments
 - First argument is the file in the source language
 - Second argument is the file in the target language
 - If dictionary in hunalign is used, make sure that the order of languages is inverse from the order in the dictionary
- To run EXALP


```
python exalp.py abc_sr.pdf abc_en.pdf
```
- Output will be structured as in Fig. 2

C Overview

C.1 Input arguments

Example of .pdf files taken as two input arguments in Fig. 3 and Fig. 4

C.2 Raw text extraction

Raw text is extracted from the input files and cleaned up as shown in Fig. 5 and Fig. 6

C.3 Unitex sentence delimiters

Unitex processes the raw text and its output is shown in Fig. 7 and Fig. 8

C.4 Sentence extraction

Unitex file is processed to contain one sentence per line as in Fig. 9 and Fig. 10

Knowledge Based Economy – the Base of Economic Growth and Development

UDC: 005.94 ; 330.341:005.336.4

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Economic development is a complex social process. Determination of factors that affect the economic growth and development, the way they work, the reasons some economies are more developed than others, and why economies have different rates of economic growth are the issues of a number of studies. Analysing these topics, and according to the economic growth theories, the traditional determinants are found to be the labour, capital and technology. However, knowledge is nowadays considered to be one of the factors of economic growth and development as well. The aim of the European Union is to build a knowledge-based economy, and hence the increased role of knowledge and new technologies. This paper analyzes the importance of knowledge as a factor of economic growth and development, and analyzes the results of building a knowledge-based economy in the European countries.

1. Introduction

Economic development is a complex social process in which every country tends to ensure a passage from the lower to the higher phases of economic development. Economic development is viewed as an indicator of the relationships between macroeconomic aggregates such as social product, national income, employment, accumulation, investments, consumption, etc. Although no economic development is possible without economic growth (there is no need for an inverse relation, i.e., the “economic growth is possible to achieve without an economic development”), it can be confined only to the growth in GDP and the per capita national income. In addition to the above mentioned elements, the economic development can be expressed by a set of structural and functional changes within a particular economy, as well as by a succession of other economic and non-economic factors. It is in this sense that economic growth is defined as a multidimensional process. The change in the overall social structure is one of the basic components of economic growth and together with economic growth it ensures the growth of both the GDP and the national income. Similarly, economic development is necessarily oriented towards achieving certain goals that have to be brought into harmony beforehand, and can be sublimed into two most important ones: the development of the economic potentials of the country and the improvement of the living standard of its population. [9, p.306]

The modern economic science insists on sustainable development. The sustainable development is defined as a development that ensures the satisfaction of the today's generations' needs, however, without endangering the satisfaction of the needs of the future generations. Sustainable growth means an optimum balance among the economic, the social, and the environmental

factors within an institutional framework. It is defined as a long-term, comprehensive, and synergetic process permeating all aspects (economic, social, cultural, ecological, and institutional) as well as all levels of life (local, regional, global). [15] The three basic pillars of sustainable development are: a sustainable economic and technological development, a sustainable development of the society and the environmental protection.

2. Knowledge as factor of economic growth and development

There are numerous factors of economic growth and development of a country or a region. They may be classed on the basis of various criteria and their impact can be analysed in detail. The most important factors are as follows: *natural conditions* (size of a country, geographical position of a country, natural resources – ores, soil, forests, etc., pollution of the nature, climate, etc.); *human resources and science* (human resources quality, human resources potential, factor – knowledge, quantity and quality of personnel training institutions, development level and efficiency of research operations, the development level of the information sector of economy, the extent to which information technologies are used, the quality of scientific personnel, information as key development resource, etc.); *production, technics and technological change and innovation* (production structure of economy, the overall production potential of the country, the level of manufacturing technics, the technical and technological progress, the type of technical progress, the rate of obsolescence – physical and economic depreciation of technics, technological change and innovation, accumulation and reproductive potential of economy, organization and methods of managing economy, the level of infrastructure sophistication, etc.); *agricultural production* (prevailing agrarian relationships and their impact upon agricultural production, the

Ekonomija zasnovana na znanju – osnov ekonomskog rasta i razvoja

UDK: 005.94 ; 330.341:005.336.4

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Privredni razvoj je veoma složen društveni proces. Određivanje faktora koji utiču na privredni rast i razvoj, kako oni deluju, zašto su pojedine privrede razvijenije od drugih, kao i zašto privrede imaju različite stope ekonomskog rasta predmet su izučavanja mnogih studija. Pri analiziranju ove tematike, a prema teorijama ekonomskog rasta, tradicionalne determinante su rad, kapital i tehnologija. Međutim, danas se i znanje smatra jednim od faktora privrednog rasta i razvoja. Cilj zemalja Evropske unije je izgradnja ekonomije zasnovane na znanju, a samim tim i povećana uloga znanja i novih tehnologija. Ovaj rad analizira značaj znanja kao faktora ekonomskog rasta i razvoja i rezultate izgradnje ekonomije zasnovane na znanju u evropskim zemljama.

1. Uvod

Privredni razvoj je složen društveni proces putem kojeg svaka zemlja teži ka prelasku iz nižih u više faze ekonomske razvijenosti. Privredni razvoj se razmatra kao pokazatelj međusobnih odnosa makroekonomskih agregata kao što su društveni proizvod, nacionalni dohodak, zaposlenost, akumulacija, investicije, potrošnja i sl. Mada nema privrednog razvoja bez privrednog porasta (ne mora da postoji i obrnuta relacija, tj. moguć je "privredni rast bez privrednog razvoja"), on se ne može ograničiti samo na rast GDP-a i nacionalnog dohotka po glavi stanovnika. Privredni razvoj se, sem pomenutih elemenata, izražava i kroz čitav skup strukturnih i funkcionalnih promena u okviru određene ekonomije kao i nizom drugih ekonomskih i neekonomskih elemenata. U tom smislu se privredni razvoj određuje kao multidimenzionalni proces. Promena ukupne društvene strukture je jedna od osnovnih komponenti privrednog razvoja i zajedno sa privrednim rastom obezbeđuje rast GDP-a i nacionalnog dohotka. Takođe, privredni razvoj je nužno usmeren ka realizaciji određenih ciljeva koje je prethodno potrebno međusobno uskladiti, a koji se mogu svesti na dva najvažnija: razvoj proizvodnih potencijala zemlje i podizanje životnog standarda stanovništva. [9, str. 306.]

Savremena ekonomska nauka insistira na održivom razvoju (*sustainable development*). Pod održivim razvojem se podrazumeva samo onaj razvoj koji obezbeđuje podmirenje potreba sadašnjih generacija, ali bez ugrožavanja mogućnosti zadovoljavanja potreba budućih generacija. Održivi razvoj podrazumeva optimalno balansiranje između ekonomskih, socijalnih i faktora zaštite životne sredine u institucionalnim okvirima. On se definiše kao dugoročan, sveobuhvatan i sinergijski proces, koji utiče na sve aspekte života (ekonomski, socijalni, kulturni, ekološki i institucionalni) i

na svim nivoima (lokalnom, regionalnom i globalnom). [15] Tri osnovna stuba održivog razvoja su: održivi ekonomski i tehnološki razvoj, održivi razvoj društva i zaštita životne sredine.

2. Znanje kao faktor ekonomskog rasta i razvoja

Mnogobrojni su faktori ekonomskog rasta i razvoja neke zemlje ili regiona. Oni se mogu rašlanjati na osnovu različitih kriterijuma, a njihova dejstva detaljno analizirati. Najznačajniji faktori su: *prirodni uslovi* (veličina zemlje, geografski položaj zemlje, prirodno bogatstvo – rude, zemljište, šume i sl., zagađenje prirode, klima itd.); *stanovništvo* (demografske karakteristike, broj stanovnika, stopa prirasta stanovništva, struktura stanovništva po polu, uzrastu, naciji i aktivnosti, oblici i stepen zaposlenosti, stepen lične i zajedničke potrošnje, nivo urbanizacije itd.); *kadrovi i nauka* (kvalitet ljudskih resursa, potencijal stručnih kadrova, faktor – znanje, kvantitet i kvalitet ustanova za obrazovanje stručnih kadrova, razvijenost i efikasnost naučno-istraživačke delatnosti, razvijenost informacionog sektora privrede, nivo korišćenja informacionih tehnologija, nivo naučnih kadrova, informacija kao ključni razvojni resurs itd.); *proizvodnja, tehnika i tehnološke promene i inovacije* (proizvodna struktura privrede, ukupan proizvodni potencijal zemlje, nivo proizvodne tehnike, tehničko-tehnološki progres, vrsta tehničkog progressa, tempo zastarevanja – fizičko i ekonomsko rabaćenje tehnike, tehnološke promene i inovacije, akumulaciona i reprodukcijona sposobnost privrede, organizacija i metodi upravljanja privredom, stepen razvijenosti infrastrukture itd.); *poljoprivredna proizvodnja* (postojeći agrarni odnosi i njihov uticaj na poljoprivrednu proizvodnju, procesi promena u agraru itd.); *društveno-politički faktori* (kulturno nasleđe, istorijsko nasleđe, tradicije u oblasti privrede, metodi i institucije društvenog upravljanja, politički sistem, položaj čoveka u dru-

Broj 57, Godina XV, Decembar 2010. Fakultet organizacionih nauka, Beograd. Izdaje Za izdavača: Dr Aleksandar Marković, Urednik. Unutrašnje rubrike: Dr. Ondrej Jasko, Urednik inostrane rubrike; Dr Jovan Filipović, Redakcioni odbor; Dr Cedomir Nestorović, Faculty of Coimbra, Portugal; Dr Dejan Petrović, FON, Beograd; Dr Jasmina Jeković, Ekonomski fakultet, Podgorica, Crna Gora; Dr Jasmina Omerbegović, Bijelovica, FON, Beograd; Dr Sonja Petrović Lazarević, Department of Management, Monash University, Australia; Dr Milan Martić, FON, Beograd; Dr Goran Putnik, Univerzitet u Minho, Portugal; Dr Mirjana Drakulić, FON, Beograd; Dr Miroslav Svatoš, Faculty of Economics, Chesh Republic; Dr Milija Suković, FON, Beograd; Dr Robert Leskovar, Faculty of Organizational Sciences, Krainj, Slovenija; Dr Siniša Nešković, FON, Beograd; Dr Stanka Setnikar Cankar, Faculty of Administration, Ljubljana, Slovenia; Dr Vinka Filipović, FON, Beograd; Dr Peter A. Belisle, Austin College; Dr Peter Bielik, Faculty of Economics and Management, Slovak Republic; Dr Milica Bulajić, FON, Beograd; Dr Sladjana Barjaktarović, FON, Beograd; Casopis se redovno referiše u publikacijama: DEST - Department of Education, Science and Training of Australia; Ulrich Periodicals; Tehnički urednik: Milivoje Radenković; Andrej Novović; Adresa redakcije: Beograd, Jove Ilića 154; Tel/Fax 011/3950-868 E-mail: menage@fon.rs http://management.fon.rs Casopis izlazi četiri puta godišnje i li po potrebi @ron račun: 840-1344666-69 [tampa Sigra Star B Beograd. CIP katalogizacija u publikaciji Narodna biblioteka Srbije, Beograd. ISSN 0354-8635 = Management (Srpsko tzd.) COBISS.SR-ID 110318855 SAOR@AJ Ekonomija zasnovana na znanju osnov ekonomskog rasta i razvoja Sandra Jednak, Dragana Krugulj Projektni menadžment i kreiranje smernica ekonomske politike na sub-nacionalnom nivou Walter Scherrer Značaj strategijskog upravljačkog računovodstva za upravljanje bankama Snežana Knežević, Miloš Milosavljević, Veljko Dmitrović Budžetske promene na lokalnom nivou tokom krize u Sloveniji Uroš Pinterić Multi otpad kao novi koncept održivog upravljanja otpadom Nataša Petrović, Sonja Isiljanović, Veljko Jeremić Mjerenje konkurentnosti kao predušlov upravljanja privredom Nikola Mlović Nova paradigma menadžmenta: od posvećenosti do inovativnosti i održive konkurentnosti p rednosti Valentina Mašević Cvečkovića osnova politike konkurentnosti u ekonomskim uslovima Republike Slovačke Jaroslava Heckova, Alexandra Chapakova, Ivana Butoracova Analiza omedjnih podataka i nje primena u obrazovanju Violeta Kvesetkovića Ekonomija zasnovana na znanju osnov ekonomskog rasta i razvoja UBK: 005.94 ; 330.341:005.336.4 Sandra Krugulj 1Fakultet organizacionih nauka u Beogradu Privredni razvoj je veoma složen društveni proces. 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U datoj zemlji i u određenom periodu na proces ekonomskog razvoja faktori deluju, ne pojedinačno, već u skupu, tako da efekti zavise od njihovog uzajamnog uticaja. Jedan faktor pojedinačno uz et, može, na primer, da nema veliki značaj za privredni razvoj određene zemlje, ali da u sklopu ostalih faktora dobije izuzetno veliku važnost. Ekonomskom analizom moguće je izdvojiti pojedinačne faktore i ukazati na njihovo dejstvo, ali se njihov značaj može oceniti samo u konkretnoj situaciji (zemlja, vreme, uslovi) i to u zajednici sa delovanjem ostalih faktora. Pojedini faktori privrednog razvoja mogu se grupisati po raznim kriterijumima zavisno od cilja analize. Najčešće podelu faktora u savremenoj ekonomskoj literaturi, značajne sa gledišta izbora strategije razvoja, polaze od sledećih kriterijuma: teritorijalnog porekla (endogeni i egzogeni faktori), vrste delatnosti (ekonomski i neekonomski faktori), materije (materijalni faktori), neposrednosti efekata (primarni i višestepeni; sekundarni, tercijija ni faktori itd.), stepena promenljivosti (promenljivi snažno, srednje, slabo i nepromenljivi faktori), stepena merljivosti (merljivi i nemerljivi), korisnosti (pozitivni i negativni faktori), značaja (re levantni i irelevantni), prioritetnosti (faktori višeg ili nižeg stepena prioritetnosti), aktualnosti (istorijski i savremeni) itd. Ovakvo raznovrstan broj faktora ekonomskog razvoja sa različitim efektima u pogledu pravca, intenziteta i dužine trajanja, ima različito dejstvo u konkretnim slučajevima. Od stepena razvijenosti i veličine zemlje zavisi ne samo prioritet faktora, već i njihov uticaj. Njihova uz ajmna sprema otežava razlučivanje efekata svakog od njih pojedinačno, a sem toga mnogi daju i nedovoljno merljive efekte. Prioritet faktora se ne može dati a priori. Veći stepen prioriteta imaju oni fakt ori privrednog razvoja koji imaju širi opseg delovanja, deluju na duži rok i koji ne podležu čestim promenama, a imaju snažno pozitivno dejstvo na kretanje i razvoj privrede. 59, str. 311.E U savremenoj e konomskoj teoriji i praksi znanje se smatra jednim od ključnih faktora privrednog rasta i razvoja. Može se reći da je znanje, zapravo, uvek bi lo pokretač ekonomskog napretka. Uvek su nove ideje, sposobno sti i veštine, kao rezultat znanja, ugrađivane u nove proizvode, procese i organizacionu strukturu kompanija. Šumpeter je prvi prepoznao znanje kao strukturnu komponentu sa ekonomskog aspekta, kao i nje n značaj u privredi. On je tvrdio da je nova kombinacija znanja ključni faktor inovacija i preduzetništva. 52E Osnovni sektori koji su stvarali znanje su: obrazovanje, istraživanje i razvoj, umetnost, med iji, informativni sektor i informacione tehnologije. Zavisno od sektora, znanje se analizira kao proizvodnja (istraživanje i razvoj novih znanja), prenos (obrazovanje, trening i razvoj ljudi) i transfer (difuzija znanja i inovacija). Sve značajniji faktor razvoja postaje integracija nauke, obrazovanja i informacionih tehnologija. 510E Pojedini istraživači ističu da se znanje može posmatrati kao esencijalni "57-58_sr_extracted.txt" [noselj 1L, 584796C

Figure 5: Raw text in Serbian

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ment Sandra Jednak, Dragana Kragulj Project management and the creation of economic policy guidelines at the sub-national level Walter Scherrer Importance of strategic management accounting for bank manage
ment Snežana Knežević, Miloš Milosavljević, Veljko Dmitrović Budgetary changes at local level in Slovenia in crisis Uroš Pinterić Zero waste as a new concept for sustainable waste management Nataša Petrov
ić, Sonja Islijanović, Veljko Jeremić Measuring competitiveness as a precondition of economic management Nikola Milović New paradigm of management: the commitment to innovation and sustainable competitive
advantage Valentin Matešević Conceptual basis of policy of competitiveness under the conditions of the Slovak economy Jaroslava Heckova, Alexandra Chapkova, Ivana Butoracova Data envelopment analysis
and its application in education Violeta Cvetkoska Knowledge Based Economy the Base of Economic Growth and Development UDC: 005.94 ; 330.341:005.336.4 Sandra Jednak, Dragana Kragulj 1.Faculty of Organiz
ational Sciences, Belgrade Economic development is a complex social process. Determination of factors that affect the economic growth and development. The way they work, the reasons some economies are more
developed than others, and why economies have different rates of economic growth are the issues of a number of studies. Analysing these topics, and according to the economic growth theories, the traditio
nal determinants are found to be the labour, capital and technology. However, knowledge is nowadays considered to be one of the factors of economic growth and development as well. The aim of the European U
nion is to build a knowledge-based economy, and hence the increased role of knowledge and new technologies. This paper analyzes the importance of knowledge as a factor of economic growth and development,
and analyzes the results of building a knowledge-based economy in the European countries. Investments, consumption, 1. Introduction Economic development is a complex social process in which every country
tends to ensure a passage from the lower to the higher phases of economic development. Economic development is viewed as an indicator of the relationships between macroeconomic aggregates such as social
product, national income, employment, accumulation, etc. Although no economic development is possible without economic growth (there is no need for an inverse relation, i.e., the economic growth is poss
ible to achieve without an economic development), it can be confined only to the growth in GDP and the per capita national income. In addition to the above mentioned elements, the economic development can
be expressed by a set of structural and functional changes within a particular economy, as well as by a succession of other economic and non-economic factors. It is in this sense that economic growth is
defined as a multidimensional process. The change in the overall social structure is one of the basic components of economic growth and together with economic growth it ensures the growth of both the GDP
and the national income. Similarly, economic development is necessarily oriented towards achieving certain goals that have to be brought into harmony beforehand, and can be sublimed into two most importa
nt ones: the development of the economic potentials of the country and the improvement of the living standard of its population. 59, p.306 The modern economic science insists on sustainable development.
The sustainable development is defined as a development that ensures the satisfaction of the today's generations needs, however, without endangering the satisfaction of the needs of the future generations.
Sustainable growth means an optimum balance among the economic, the social, and the environmental factors within an institutional framework. It is defined as a long-term, comprehensive, and synergetic pro
cess permeating all aspects (economic, social, cultural, ecological, and institutional) as well as all levels of life (local, regional, global). 51SE The three basic pillars of sustainable development are
: a sustainable economic and technological development, a sustainable development of the society and the environmental protection. 2. Knowledge as factor of economic growth and development There are numer
ous factors of economic growth and development of a country or a region. They may be classed on the basis of various criteria and their impact can be analysed in detail. The most important factors are as
follows: natural conditions (size of a country, geographical position of a country, natural resources ores, soil, forests, etc., pollution of the nature, climate, etc.); human resources and science (human
resources quality, human resources potential, factor knowledge, quantity and quality of personnel training institutions, development level and efficiency of research operations, the development level of t
he information sector of economy, the extent to which information technologies are used, the quality of scientific personnel, information as key development resource, etc.); production, technicals and techn
ological change and innovation (production structure of economy, the overall production potential of the country, the level of manufacturing technicals, the technical and technological progress, the type of
technical progress, the rate of obsolescence physical and economic depreciation of technicals, technological change and innovation, accumulation and reproductive potential of economy, organization and meth
ods of managing economy, the level of infrastructure sophistication, etc.); agricultural production (prevailing agrarian relationships and their impact upon agricultural production, the processes of chang
e in agriculture, etc.); socio-political factors (cultural heritage, historical heritage, tradition in economy, methods and institutions of social management, political system, the position of an individu
al in the society, social security, degree of democracy, ability to stand against different forms of pressures from the part of economically developed and politically influential countries, etc.); interna
tional environment (international economic environment, international labour division, the level and trends of international regional integrations, international economic organizations, international poli
tical environment, international and political alliances, itd). The process of economic development in a given country and in a given period is affected not by individual factors, but by a set of factors
, therefore the effects depend on their interaction. One individual factor, for example, may not have a significant impact upon the economic development of a country, however, within a set of other factor
s, its importance may be crucial. Using the economic analysis it is possible to select individual factors and highlight their impact, however, their importance can be evaluated only in a concrete situatio
n (country, time, conditions), and together with the impact of the other factors. Certain factors of economic development can be grouped according to different criteria, depending of the objective of the
analysis. The most frequent classifications in the modern economic literature, important from the point of view of the development strategy selection, observe the following criteria: territorial origins (
endogenous and exogenous factors), type of operations (economic and non-economic factors), matter (material factors), immediacy of effects (primary and multiple; secondary, tertiary factors, etc.), the ra
te of volatility (strongly volatile, medium volatile, slightly volatile factors), measurability level (measurable and non-measurable), utility (positive and negative factors), relevance (relevant and irre
levant), priority (higher or lower level priority factors) up-to-dateness (historical and modern), etc. Such a variety of economic development factors with different impacts as regards the orientation, i
ntensity and the length of time produce different impacts in different cases. The development level and the size of a country will affect not only the priority of factors but their impact as well. Their i
nteraction makes the understanding the impact of each individual factor difficult; besides, many of them produce insufficiently measurable effects. The priority of factors cannot be given a priori. A high
er level of priority is given to those economic development factors that produce a wider scope of effects, they work on a long-term basis, they are not subject to frequent changes and produce a strong pos

Figure 6: Raw text in English

Broj 57, Godina XV Decembar 2010. (S) Fakultet organizacionih nauka Beograd Izdaje Za izdavača: (S) Dr Milan Martić Glavni i odgovorni urednik Dr Aleksandar Marković Urednik unutrašnje rubrike Dr Ondrej Jaško Urednik inostrane rubrike Dr Jovan Filipović Redakcioni odbor: dr Čedomir Nestorović, Faculty of Coimbra, Portugal dr Dejan Petrović, FON, Beograd dr Jasmina Jeković, Ekonomski fakultet, Podgorica, Crna Gora dr Jasmina Omerbegović Bljelović, FON, Beograd dr Sonja Petrović Lazarević, Department of Management, Monash University, Australia dr Milan Martić, FON, Beograd dr Goran Putnik, Univerzity of Minho, Portugal dr Mirjana Drakulić, FON, Beograd dr Miroslav Svatoš, Faculty of Economics, Chesh Republic dr Milija Suković, FON, Beograd dr Robert Leskovic, Faculty of Organizational Scienc in Kranj, Slovenia dr Vinko Nesković, FON, Beograd dr Roberto Biloslavo, Faculty for Management, Koper, Slovenia dr Vesna Milčević, FON, Beograd dr Stanka Setnikar Cankar, Faculty of Administration, Ljubljana, Slovenia dr Vinka Filipović, FON, Beograd dr Peter A. Delisle, Austin College dr Peter Bielek, Faculty of Economics and Management, Slovak Republic dr Milica Bulajić, FON, Beograd dr Sladjana B arjakarović, FON, Beograd Časopis se redovno referiše u publikacijama: (S) DEST- Department of Education, Science and Training of Austraita Ulrich Periodicals Tehnički urednik Milivoje Radenković Andrej N ović Adresa redakcije Beograd, Jove Ilica 154 Tel/Fax 011/3950-868 E-mail: manage.fon.rs http://management.fon.rs Časopis izlazi četiri puta godišnje ili po potrebi (tiro račun: (S) 840-1344666-69 [tampa Slgra Star Beograd CIP katalogizacija u publikaciji Narodna biblioteka Srbije, Beograd ISSN 0354-8635 = Management (Srpsko izd.) COBISS: (S) SR-ID 110318855 SADRŽAJ Ekonomija zasnovana na znanju osnov e konoskog rasta i razvoja Sandra Jednak, Dragana Kragulj Projektni menadžment i kreiranje smernice ekonomske politike na sub-nacionalnom nivou Walter Scherrer Značaj strategijskog upravljačkog računovodst va za upravljanje bankama Knežević, Miloš Milosavljević, Veljko Dnitrović Budžetske promene na lokalnom nivou tokom uloš Plinterić Multi otpad kao novi koncept održivog upravljanja a otpadom Nataša Petrović, Sonja Išljanović, Veljko Jeremić Mjerenje konkurentnosti kao preduslov upravljanja privredom Nikola Milović Nova paradigma menadžmenta: od posvećenosti do inovativnosti i održive konkurentske prednosti Valentina Malešević Konceptualna osnova politike konkurentnosti u ekonomskim ustovima Republike Slovačke Jaroslava Heckova, Alexandra Chapčakova, Ivana Butoracova Analiza omedjetnih podataka i njena primena u obrazovanju Violeta Cvetkowska Ekonomija zasnovana na znanju osnov ekonomskog rasta i razvoja UK: (S) 005.94 ; 330.341:005.336.4 Sandra Jednaki, Dragana Kragulj Ifakultet organ izacionih nauka u Beogradu Privredni razvoj je veoma složen društveni proces. (S) Određivanje faktora koji utiču na privredni rast i razvoj, zašto su pojedine privrede razvijenije od drugih, kao i zašto privrede imaju različite stope ekonomskog rasta predmet su izučavanja mnogih studija. (S) Pri analiziranju ove tematike, a prema teorijama ekonomskog rasta, tradicionalne determinante su rad h, kapital i tehnologija. (S) Međutim, danas se i znanje smatra jednim od faktora privrednog rasta i razvoja. (S) Cilj zemalja Evropske unije je izgradnja ekonomije zasnovane na znanju, a samim tim i povećan a uloga znanja i novih tehnologija. (S) Ovak rad analizira značaj znanja kao faktora ekonomskog rasta i razvoja i rezultate izgradnje ekonomije zasnovane na znanju u evropskim zemljama. 1. (S) Uvod Privredn i razvoj je složen društveni proces putem kojeg svaka zemlja teži ka prelasku iz nižih u više faze ekonomske razvijenosti. (S) Privredni razvoj se razmatra kao pokazatelj međusobnih odnosa makroekonomskih agregata kao što su društveni proizvod, nacionalni dohodak, zaposlenost, akumulacija, investicije, potrošnja i sl. (S) Mada nema privrednog razvoja bez privrednog porasta (ne mora da postoji i obrnuta rela cija, tj. moguć je privredni rast bez privrednog razvoja), on se ne može ograničiti samo na rast GDP-a i nacionalnog dohotka po glavi stanovnika. (S) Privredni razvoj se, sem pomenutih elemenata, izražava i kroz čitav skup strukturalnih i funkcionalnih promena u okviru određene ekonomije kao i nizom drugih ekonomskih i neekonomskih elemenata. (S) U tom smislu se privredni razvoj određuje kao multidimenzionaln i proces. (S) Promena ukupne strukture je jedna od osnovnih komponenti privrednog razvoja i zajedno sa privrednim rastom obezbeđuje rast GDP-a i nacionalnog dohotka. (S) Takođe, privredni razvoj j e nužno usmeren ka realizaciji određenih ciljeva koje je prethodno potrebno međusobno uskladiti, a koji se mogu svesti na dva najvažnija: razvoj proizvodnih potencijala zemlje i podizanje životnog standar da stanovništva. (S) 59, str. 306. (S) Savremena ekonomska nauka insistira na održivom razvoju (sustainable development). (S) Pod održivim razvojem se podrazumeva samo onaj razvoj koji obezbeđuje podmirenje potreba sadašnjih generacija, ali bez ugrožavanja mogućnosti zadovoljavanja potreba budućih generacija. (S) Održivi razvoj podrazumeva optimalno balansiranje između ekonomskih, socijalnih i faktora zaštite životne sredine i institucionalnim okvirima. (S) On se definiše kao dugoročan, sveobuhvatan i sinergijski proces, koji utiče na sve aspekte života (ekonomski, socijalni, kulturni, ekološki i institucionalni) i na svim nivoima (lokalnom, regionalnom i globalnom). (S) 515E Tri osnovna stuba održivog razvoja su: održivi ekonomski i tehnološki razvoj, održivi društva i zaštita životne sredine. 2. (S) Zn anje kao faktor ekonomskog rasta i razvoja Mnogobrojni su faktori ekonomskog rasta i razvoja neke zemlje ili regiona. (S) Oni se mogu rastavljati na osnovu različitih kriterijuma, a njihova dejstva detalj no analizirati. (S) Najznačajniji faktori su: prirodni uslovi (veličina zemlje, geografski položaj zemlje, prirodno bogatstvo rude, zemljište, šume i sl., zagađenje prirode, klima itd.); stanovništvo (demo grafске karakteristike, broj stanovnika, stopa prirasta stanovništva, struktura stanovništva po polu, uzrastu, naciji i aktivnosti, oblici i stepen zaposlenosti, stepen lične i zajedničke potrošnje, nivo urbanizacije itd.); kadrovi i nauka (kvalitet ljudskih resursa, potencijal stručnih kadrova, faktor znanje, kvantitet i kvalitet ustanova za obrazovanje stručnih kadrova, razvijenost i efikasnost naučno-istraživačke delatnosti, razvijenost informacionog sektora privrede, nivo naučnih kadrova, informacija kao ključni resurs itd.); proizvodnja, tehnika i tehnološke promene i inovacije (proizvodna struktura privrede, ukupan proizvodni potencijal zemlje, nivo proizvodne tehnike, tehnološki progres, vrsta tehničkog progressa, tempo zastarevanja fizič ko i ekonomsko rabačenje tehnike, tehnološke promene i inovacije, akumulaciona i reprodukciona sposobnost privrede, organizacija i metodi upravljanja privredom, stepen razvijenosti infrastrukture itd.); p oljoprivredna proizvodnja (postojeći agrarni odnosi i njihov uticaj na poljoprivrednu proizvodnju, procesi promena u agraru itd.); društveno-politički faktori (kulturno nasleđe, istorijsko nasleđe, tradic ije u oblasti privrede, metodi i institucije društvenog upravljanja, politički sistem, položaj čoveka u društvu, socijalna sigurnost, stepen demokratije, sposobnost odbrane od različitih oblika pritisaka ekonomski razvijenih i politički uticajnih zemalja itd.); međunarodno okruženje (međunarodno-ekonomsko okruženje, međunarodna podela rada, nivo i pravci međunarodnih regionalnih integracija, međunarodne ekonomske organizacije, međunarodno-političko okruženje, međunarodni i politički savezi itd.). (S) U datoj zemlji i u određenom periodu na proces ekonomskog razvoja faktori deluju, ne pojedinačno, već u sku pu, tako da efekti zavise od njihovog uzajamnog uticaja. (S) Jedan faktor pojedinačno uzet, može, na primer, da nema veliki značaj za privredni razvoj određene zemlje, ali da u sklopu ostalih faktora doblj e izuzetno veliku važnost. (S) Ekonomskom analizom moguće je izdvojiti pojedinačne faktore i ukazati na njihovo dejstvo, ali se njihov značaj može oceniti samo u konkretnoj situaciji (zemlja, vreme, uslovi) i to u zajednici sa delovanjem ostalih faktora. (S) Pojedini faktori privrednog razvoja mogu se grupisati po raznim kriterijumima zaviso od cilja analize. (S) Najčešće podela faktora u savremenoj ekonoms koj literaturi značajne sa gledišta izbora strategije razvoja polaze od sledećih kriterijuma: teritorijalnog porekla (endogeni i egzogeni faktori), vrste delatnosti (ekonomski i neekonomski faktori), na terlje (materijalni faktori), neposrednosti efekata (primarni i višestepeni; sekundarni, tercijarni faktori itd.), stepena promenljivosti (promenljivi snažno, srednje, slabo i nepromenljivi faktori), step ena merljivosti (merljivi i nemerljivi), korisnosti (pozitivni i negativni faktori), značaja (relevantni i irelevantni), prioritetnosti (faktori višeg ili nižeg stepena prioritetnosti), aktuelnosti (istor ijski i savremeni) itd. (S) Ovakvo raznovrstan broj faktora ekonomskog razvoja sa različitim efektima i dužine trajanja ima različito dejstvo u konkretnim slučajevima. (S) Od st epena razvijenosti i veličine zemlje zavisi ne samo prioritet faktora, već i njihov uticaj. (S) Njihova uzajamna sprega određava različitavanje efekata svakog od njih pojedinačno, a sem toga mnogi daju i nedo voljno merljive efekte. (S) Prioritet faktora se ne može dati a priori. (S) Veći stepen prioriteta imaju oni faktori privrednog razvoja koji imaju širi opseg delovanja, deluju na duži rok i koji ne podležu čestim promenama, a imaju snažno pozitivno dejstvo na kretanje i razvoj privrede. (S) 59, str. 311. (S) U savremenoj ekonomskoj teoriji i praksi znanje se smatra jednim od ključnih faktora privrednog rasta i razvoja. (S) Može se reći da je znanje, zapravo, uvek bito pokretač ekonomskog napretka. (S) Uvek se nove ideje, sposobnosti i vешtine, kao rezultat znanja, ugrađivane u nove proizvode, procese i organi zacionu strukturu kompanija. (S) Schumpeter je prvi prepoznao znanje kao strukturalnu komponentu sa ekonomskog aspekta, kao i njen značaj u privrednoj. (S) On je tvrdio da je nova kombinacija znanja ključni fak tor inovacija i preduzetništva. (S) 52E Osnovni sektori koji su stvarali znanje su: obrazovanje, istraživanje, istraživanje i razvoj, umetnost, medij, informativni sektor i informacione tehnologije. (S) Zaviso od sektora, znanje se analizira kao proizvodnja (istraživanje i razvoj novih znanja), prenos (difuzija znanja) i transfer (difuzija ljudi) i faktor razvoja (inovacija). (S) Sve značajniji faktor razvoja postaj a "57-58_sr_unitex.txt" [nosoi][converted] 1L, 595676C

Figure 7: Unitex processed text in Serbian

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(S) Publisher Faculty of Organizational Sciences - Belgrade Dean Milan Martić, Ph.D. Editor in Chief Aleksandar Marković, Ph.D. Editor of Internal Department Ondrej Jaško, Ph.D. Editor of International Department Jovan Filipović, Ph.D. Editor of Colmbra, Portugal Editorial Board: Dejan Petrović, Ph.D., Faculty of Organizational Sciences, Belgrade; Jasmina Jeković, Ph.D., Faculty of Economics, Podgorica, Montenegro; Jasmina Omerbegović Bljelović, Ph.D., Faculty of Organizational Sciences, Belgrade; Goran Putnik, Ph.D., University of Minho, Portugal; Mirjana Drakulić, Ph.D., Department of Management, Monash University, Australia; Milan Martić, Ph.D., Faculty of Organizational Sciences, Belgrade; Robert Leskovar, Ph.D., Faculty of Organizational Sciences, Kranj, Slovenia; Sintša Nešković, Ph.D., Faculty of Organizational Sciences, Belgrade; Roberto Biloslavo, Ph.D., Faculty for Management, Koper, Slovenia; Vesna Miličević, Ph.D., Faculty of Organizational Sciences, Belgrade; Stanka Setnikar Cankar, Ph.D., Faculty of Administration, Ljubljana, Slovenia; Vinka Filipović, Ph.D., Faculty of Organizational Sciences, Belgrade; Peter A. Belisle, Ph.D., Austin College, Peter Bielek, Ph.D., Faculty of Economics and Management, Slovak Republic; Milica Bulajić, Ph.D., Faculty of Organizational Sciences, Belgrade; Sladjana Barjaktarović, Ph.D., Faculty of Organizational Sciences, Belgrade. Management is being regularly reviewed in DEST DEST - department of Education, Science and Training of Australia. Ulrich Periodicals Technical Editor Milivojke Radenković Andrej Novović Address: Bibrade Jove Ilča 154 Tel./fax: (S) 381 11 3950 868 E-mail: management.fon.rs <http://management.fon.rs/> Journal is published quarterly Printed by Siga Star, Belgrade. Čip Katalozičakcija u publikaciji Narodna biblioteka Srbije, Beograd ISSN 1820-0222 = Management (Engl.) ed. (S) COBISS.SR-ID 112265484 Copyright © 2004 by Faculty of Organizational Sciences. CONTENTS Knowledge based economy the base of economic growth and development Sandra Jednak, Dragana Kragulj Project management and the creation of economic policy guidelines at the sub-national level Walter Scherrer Importance of strategic management accounting for bank management Snežana Krnjević, Miloš Milosavljević, Veljko Dimitrović Budgetary changes at local level in Slovenia in crisis Uroš Pinterić Zero waste as a new concept for sustainable waste management Nataša Petrović, Sonja Istjanović, Veljko Jeremić Measuring competitiveness as a precondition of economic management Nikola Milošević Jaroslava Hečkova, Alexandra Čapčakova, Ivana Butoracova Data envelopment analysis and its application in education Violeta Cvetkoska Knowledge Based Economy the Base of Economic Growth and Development UBC: 005.94 : 330.341:005.336.4 Sandra Jednak1, Dragana Kragulj1 Faculty of Organizational Sciences, Belgrade Economic development is a complex social process. (S) Determination of factors that affect the economic growth and development, the way they work, the reasons some economies are more developed than others, and why economies have different rates of economic growth are the issues of a number of studies. (S) Analysing these topics, and according to the economic growth theories, the traditional determinants are found to be the labour, capital and technology. (S) However, knowledge is nowadays considered to be one of the factors of economic growth and development as well. (S) The aim of the European Union is to build a knowledge-based economy, and hence the increased role of knowledge and new technologies. (S) This paper analyzes the importance of knowledge as a factor of economic growth and development, and analyzes the results of building a knowledge-based economy in the European countries. Investments, consumption, 1. (S) Introduction Economic development is a complex social process in which every country tends to ensure a passage from the lower to the higher phases of economic development. (S) Economic development is viewed as an indicator of the relationships between macro economic aggregates such as social product, national income, employment, etc. (S) Although no economic development is possible without economic growth (there is no need for an inverse relation, i.e., the economic growth is possible to achieve without an economic development), it can be confined only to the growth in GDP and the per capita national income. (S) In addition to the above mentioned elements, the economic development can be expressed by a set of structural and functional changes within a particular economy, as well as by a succession of other economic and non-economic factors. (S) It is in this sense that economic growth is defined as a multidimensional process. (S) The change in the overall social structure is one of the basic components of economic growth and together with economic growth it ensures the growth of both the GDP and the national income. (S) Similarly, economic development is necessarily oriented towards achieving certain goals that have to be brought into harmony beforehand, and can be sublimed into two most important ones: the development of the economic potentials of the country and the improvement of the living standard of its population. (S) 59 p. 306€ The modern economic science insists on sustainable development. (S) The sustainable development is defined as a development that ensures the satisfaction of the today's generations' needs, however, without endangering the satisfaction of the needs of the future generations. (S) Sustainable growth means an optimum balance among the economic, the social, and the environmental factors within an institutional framework. (S) It is defined as a long-term, comprehensive, and synergetic process permeating all aspects (economic, social, cultural, ecological, and institutional) as well as all levels of life (local, regional, global). (S) 51€ The three basic pillars of sustainable development are: a sustainable economic and technological development, a sustainable development of the society and the environmental protection. (S) 2. (S) Knowledge as a factor of economic growth and development There are numerous factors of economic growth and development of a country or a region. (S) They may be classed on the basis of various criteria and their impact can be analysed in detail. (S) The most important factors are as follows: natural conditions (size of a country, geographical position of a country, natural resources, soil, forests, etc.), pollution of the nature, climate, etc.); human resources (quality, quantity and quality of personnel training institutions, development level and efficiency of research operations, the development level of the information sector of economy, the extent to which information technologies are used, the quality of scientific personnel, information as a key development resource, etc.); production, technical and technological change and innovation (production structure of economy, the overall production potential of the country, the level of manufacturing techniques, the technical and technological progress, the type of technical progress, the rate of obsolescence physical and economic depreciation of technical, technological change and innovation accumulation and reproductive potential of economy, organization and methods of managing economy, etc.); agricultural production (prevailing agrarian relations and their impact upon agricultural production, the processes of change in agriculture, etc.); socio-political factors (cultural heritage, historical heritage, tradition in economy, methods and institutions of social management, political system, the position of an individual in the society, social security, degree of democracy, ability to stand against different forms of pressures from the part of economically developed and politically influential countries, etc.); international economic environment (international labour division, the level and trends of international regional integrations, international economic organizations, international political environment, international and political alliances, etc.). (S) The process of economic development in a given country and in a given period is affected not by individual factors, but by a set of factors, therefore the effects depend on their interaction. (S) One individual factor, for example, may not have a significant impact upon the economic development of a country, however, within a set of other factors, its importance may be crucial. (S) Using the economic analysis it is possible to select individual factors and highlight their impact, however, their importance can be evaluated only in a concrete situation (country, time, conditions), and together with the impact of the other factors. (S) Certain factors of economic development can be grouped according to different criteria, depending of the objective of the analysis. (S) The most frequent classifications in the modern economic literature, important from the point of view of the development strategy selection, observe the following criteria: territorial origins (endogenous and exogenous factors), type of operations (economic and non-economic factors), matter (material factor), immediacy of effects (primary and multiple; secondary, tertiary factors, etc.), the rate of volatility (strongly volatile, medium volatile, slightly volatile factors), measurability level (measurable and non-measurable), utility (positive and negative factors), relevance (relevant and irrelevant), priority (higher or lower level priority factors), up-to-dateness (historical and modern), etc. (S) Such a variety of economic development factors with different impacts as regards the orientation, intensity and the length of time produce different impacts in different cases. (S) The development level and the size of a country will affect not only the priority of factors but their impact as well. (S) Their interaction makes the understanding the impact of each individual factor difficult; besides, many of them produce insufficiently measurable effects. (S) The priority of factors cannot be given a priori. (S) A higher level of priority is given to those economic development factors that produce a wider scope of e

Figure 8: Unitex processed text in English

157 Number 57, Year XV December 2010.
 Publisher Faculty of Organizational Sciences - Belgrade Dean Milan Martić, Ph.D. Editor in Chief Aleksandar Marković, Ph.D. Editor of Internal Department Ondrej Jaško, Ph.D. Editor of International Department
 381 11 3950 808 E-mail: management.fon.rs/ http://management.fon.rs/ Journal is published quarterly Printed by Sigra Star, Belgrade CIP katalogizacija u publikaciji Narodna biblioteka Srbije, Beograd ISSN 18
 e08155.SR-ID 112265484 Copyright © 2004 by Faculty of Organizational Sciences CONTENTS Knowledge based economy the base of economic growthand development Sandra Jednak, Dragana Kragulj Project management
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 Analysing these topics, and according to the economic growth theories, the traditional determinants are found tobe the labour, capital and technology.
 However, knowledge is nowadays considered to be one of the factors of economic growth and development as well.
 The aim of the European Union is to build a knowledge-based economy, and hence the increased role of knowledge and new technologies.
 This paper analyzes the importance of knowledge as a factor of economic growth and development, and analyzes the results of building a knowledge-based economy in the European countries. investments, cons
 Introduction Economic development is a complex social process in which every country tends to ensure a passage from the lower to the higher phases of economic development.
 Economic development is viewed as an indicator of the relationships between macroeconomic aggregates such as social product, national income, employment, accumulation, etc.
 Although no economic development is possible without economic growth (there is no need for an inverse relation, i.e., the economic growth is possible to achieve without an economic development), it can
 In addition to the above mentioned elements, the economic development can be expressed by a set of structural and functional changes within a particular economy, as well as by a succession of other econ
 It is in this sense that economic growth is defined as a multidimensional process.
 The change in the overall social structure is one of the basic components of economic growth and together with economic growth it ensures the growth of both the GDP and the national income.
 Similarly, economic development is necessarily oriented towards achieving certain goals that have to be brought into harmony beforehand, and can be sublimed into two most important ones: the developemnt
 \$9, p.306\$ The modern economic science insists on sustainable development.
 The sustainable development is defined as a development that ensures the satisfaction of the todays generations needs, however, without endangering the satisfaction of the needs of the future generations.
 Sustainable growth means an optimum balance among the economic, the social, and the environmental factors within an institutional framework.
 It is defined as a long-term, comprehensive, and synergetic process permeating all aspects (economic, social, cultural, ecological, and institutional) as well as all levels of life (local, regional, glob
 \$15\$ The three basic pillars of sustainable development are: a sustainable economic and technological development, a sustainable development of the society and the environmental protection.
 2.
 Knowledge as factor of economic growth and development There are numerous factors of economic growth and development of a country or a region.
 They may be classed on the basis of various criteria and their impact can be analysed in detail.
 The most important factors are as follows: natural conditions (size of a country, geographical position of a country, natural resources ores, soil, forests, etc., pollution of the nature, climate, etc.);
 The process of economic development in a given country and in a given period is affected not by individual factors, but by a set of factors, therefore the effects depend on their interaction.
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 The development level and the size of a country will affect not only the priority of factors but their impact as well.
 Their interaction makes the understanding the impact of each individual factor difficult; besides, many of them produce insufficiently measurable effects.
 The priority of factors cannot be given a priori.
 A higher level of priority is given to those economic development factors that produce a wider scope of effects, they work on a long-term basis, they are not subject to frequent changes and produce a str
 \$9, p.311\$ Modern economic theory and practice views knowledge as one of the key factors of economic growth and development.
 Knowledge, in fact, can be said to have always been the driver of economic progress.
 New ideas, skills and competences resulting from knowledge have always been incorporated into new products, processes and organizational structure of companies.
 Schumpeter was the first to recognize knowledge as a structural component from an economic point of view, as well as its importance for the economy.
 He claimed that a new combination of knowledge is a key factor of innovation and entrepreneurship.
 \$2\$ The basic sectors responsible for knowledge generation are: education, research and development, art, media, information sector and information technologies.
 Depending on the sector, knowledge is analysed as production (research and development of new knowledge), dissemination (education, training and human resources development) and transfer (diffusion of kn
 A development factor that is becoming increasingly important is the integration of science, education and information technologies.
 \$10\$ Some researchers maintain that knowledge can be viewed as an essential resource, product and system.
 The view of the knowledge as an input is related to investment into research and development, education and information technologies.
 As a product, knowledge is important in developing business services based on knowledge, as well as in the development of the new technology sector.
 It is implemented in improving the existing products and creating new ones.
 \$7\$ Science demands a system of knowledge.
 Different kinds of knowledge are required to achieve progress in a certain area.
 New technologies, i.e., information-communication technologies, are the instrument to generate and transfer knowledge.
 Owing to browsers, electronic databases and various softwares, the scientists and researchers enjoy a faster access to information, development and storage of results, or knowledge, and this all results
 The comparison between capital, labour and knowledge, however, clearly shows that knowledge displays certain features of a traditional factor.

Figure 10: Extracted sentences in English

C.5 hunalign's output

hunalign's output in text format is in Fig. 11 and hunalign's output in readable html format is in Fig. 12

C.6 Gargantua's output

Gargantua's output in text format is in Fig. 13 and Gargantua's output in readable html format is in Fig. 14

D Evaluation

It is possible to evaluate EXALP's alignment if there is ground truth data available.

To run `eval.py`:

```
python eval.py manual_text.txt eval_text 80 > results.txt
```

- First argument is the manually aligned text
It should have the following format:
`This sentence is in the source language.`
`This sentence is in the target language.`
- Second argument is aligned text to be evaluated
It should have the same format as hunalign's or Gargantua's output
- Third argument is the threshold for Levenshtein distance, i.e. fuzzy string matching — 80 gives good results
- Final evaluation output are precision and recall measure
- Recall measures the number of sentences from the manual data that match the sentences from evaluated data
- Precision measures if the sentences are paired well

For additional details and code please consult the electronic appendix in the USB attached.

<p>Efikasnost tehnološke i inovacione politike kao sredstva za poboljšanje konkurentnosti ekonomije zavisi od izvora, a to su znanje i istraživački potencijal, uključujući kanale za transfer i difuziju tehnološkog progressa s jedne strane, i od instrumenata kojima se stimulise spremnost i volja poslovne sfere da preuzme povećani rizik koji je povezan sa inovativnom aktivnošću, s druge strane.</p> <p>Od jednako značaja je i da inovacije budu jednako usmerene i prema procesima, što određuje i način na koji će se postići konkurentna prednost (kvalitativno novim parametrima korisnosti proizvoda ili racionalizacijom putem nižih troškova proizvodnje koji će uticati na cenu proizvoda).</p> <p>Struktura tehnološko-inovacione politike prikazana je na dijagramu 2. ~~~ Izvor:</p>	<p>Efficiency of technological and innovation policy as a mean of improvement of economics competitiveness depends on sources, representing knowledge and research potential, including the channels of transfer and diffusion of technological progress on one hand, and on instruments stimulating the willingness of business sphere to undergo increased risk connected with innovation activities, on the other hand.</p> <p>Also balance in orientation of innovations to product- and process ones is of the same importance, what determines the way of achievement of competitive advantage (by qualitatively new utility parameters of products or by rationalization by lower production costs influencing the price of products).</p> <p>Diagram 2 shows the structure of technological and innovation policy. ~~~ Diagram 2.</p>
<p>Š6, str. 175E u ekonomskim uslovima Republike Slovačke, slično drugim privredama u tranziciji, tehnološko-inovaciona politika nije u potpunosti primenjena.</p>	<p>Structure of technological and innovation policy Source: Š6, p. 175E Under the conditions of the Slovak economics, similarly as for other transforming economies, technological and innovation policy is not accomplished thoroughly by then.</p>
<p>Neophodno je identifikovati pravce istraživanja i razvoja u industriji u odgovarajućem programu koji se onda može upotrebiti u diferencijaciji proizvoda i procesa, a u okviru zajedničke tendencije podrške stvaranju, difuziji i primeni tehnologija i inovacija (kako se to i nameće u ekonomski naprednim privredama).</p> <p>Po našem mišljenju, programski sadržaj istraživanja i razvoja u oblasti industrije odnose se u najvećoj meri na tri glavne oblasti S4E, S8E a to su sledeće: ~~~ 1) Istraživanje i razvoj usmereni na ostvarivanje veće dodatne vrednosti.Cilj ove grupe istraživanja i razvoja u industriji biće da doprinesu povećanju dodatne vrednosti industrijske proizvodnje u SR.</p>	<p>It is necessary to identify directions of industrial research and development by a program, which could be used in the process of product differentiation, within a common tendency of support of creation, diffusion and implementation of technologies and innovations (enforcing in economically advanced economies).</p> <p>According to our opinion, the program contents of industrial research and development would be focused to three main areas S4E, S8E as it follows: 1) Research and development focused to achievement of high value added.The aim of the given group of industrial research and development will be to contribute to the increase of value added of industrial production in SR.</p>
<p>Poželjno bi bilo iskoristiti faktore intenzifikacije kao što su istraživanje i razvoj na dugoročnom planu, tako da deo dodatne vrednosti ukupne proizvodnje u prerađivačkoj industriji poraste na 35% do 2020.</p>	<p>It is desirable to utilize the intensifying factors including research and development in the long-term horizon, so that the portion of value added on gross production in processing industry to increase by 2020 to the level of 35%.</p>
<p>godine. 2) Istraživanje i razvoj kojim se obezbeduje razvoj inovacija u standardu Cilj ove grupe istraživanja i razvoja u industriji biće da obezbedi veću konkurentnost domaće proizvodnje u okviru otvorenog slobodnog tržišta Evropske unije.</p> <p>Na dugoročnom planu, ono će se ogledati u sve većoj pokrivenosti domaće potrošnje domaćom proizvodnjom, posebno u industriji nameštaja, proizvodnji papira, farmaceutske industriji, proizvodnji obuće i tekstilnoj industriji za 15-20%, što znači da bi nivo pokrivenosti proizvodima domaće lake industrije (uključujući i farmaceutske industriju) dostigao 60-65%.</p>	<p>2) Research and development ensuring standard innovation development The aim of the given group of industrial research and development will be to ensure an increase of competitiveness of domestic production within opened internal market of the European Union.</p> <p>In the long-term horizon, it would be reflected by an increase of coverage of domestic consumption by domestic production, especially in the furniture industry, paper industry, pharmaceutical industry, footwear industry and textile industry by 15-20%, what means that the level of domestic coverage in light industry (including pharmacy) would attain 60-65%.</p>
<p>Istovremeno, poželjno je da se poveća konkurentnost standardnih proizvoda prerađivačke industrije primenom inovativnih procesa. ~~~ To se posebno odnosi na industriju mašina, elektrotehniku i hemijsku industriju, tako da bi se ovaj porast video na dugoročnom planu, sve do potpunog uspostavljanja ravnoteže u spoljnoj trgovini Slovačke.</p>	<p>At the same time, it is desirable to increase competitiveness of standard commodities of processing industry by innovation process, especially of machinery industry, electrotechnical industry and chemical industry so that this increase of value could be shown in long-term horizon up to the adjustment of foreign-trade balance of Slovakia.</p>
<p>3) Istraživanje i razvoj kao podrška rešavanju globalnih problema Cilj ove grupe istraživanja i razvoja u industriji biće da se uključi u rešavanje globalnih problema, posebno u sferi zaštite životne sredine, zdravlja stanovništva i da obezbedi održivi razvoj.</p> <p>Na dugoročnom planu, ovo znači da će se postepeno povećavati ukupni troškovi za istraživanje i razvoj, tako da bismo dostigli nivo zemalja čija je ekonomija slična našoj.</p>	<p>3) Research and development supporting global problems handling The aim of this given group of industrial research and development shall be to join to handling of global problems, especially in the sphere of protection of living environment, health of population and ensuring of fulfillment of indicators of sustainable development. In the long-term horizon, it means to increase total expenditures to research and development gradually, so that we could attain the level of economically comparable countries of the EU.</p>
<p>Očekuje se da će do 2020. godine pokazatelj ukupnih troškova za istraživanje i razvoj dostići 1,5% BDP. Ipak, ovo zahteva da dinamika kojom se povećavaju izdvajanja za istraživanje i razvoj bude veća, posebno kad se radi o preduzetničkoj sferi.</p>	<p>It is expected that the indicator of total expenditures for research and development could be on the level of 1,5% GDP by 2020. However, it requires to increase dynamically the portion of expenditures for research and development especially from the part of entrepreneurial sphere.</p>

Figure 12: humalign's html output

0.5 Fakultet organizacionih nauka Beograd Izdaje Za izdavača: Number 57, Year XVI December 2010.

SR-ID 110318855 SADR@AJ Ekonomija zasnovana na znanju osnov ekonomskog rasta i razvoja Sandra Jednak, Dragana Kragulj Projektni menadžment i kreiranje smernica ekonomske politike na sub-nacionalnom nivou Walter Scherrer Značaj strategijskog upravljačkog računovodstva za upravljanje bankama Snežana Knežević, Miloš Milosavljević, Veljko Dmitrović Budžetske promene na lokalnom nivou tokom krize u Sloveniji i Uroš Pinterić Multi otpad kao novi koncept održivog upravljanja otpadom Nataša Petrović, Sonja Išljamović, Veljko Jeremić Mjerenje konkurentnosti kao preduslov upravljanja privredom Nikola Milović Nova paradigma menadžmenta: od posvećenosti do inovativnosti i održive konkurentnosti Valentina Mašević Konceptijska osnova politike konkurentnosti u ekonomskoj ustovini Republike Slovačke Jaroslava Hecčkova, Aleksandra Čapčakova, Ivana Butoracova Analiza omedjnih podataka i njena primena u obrazovanju Violeta Cvetkoska Ekonomija zasnovana na znanju osnov ekonomskog rasta i razvoja UDK: 005.94 ; 330.341:005.336.4 Sandra Jednak, Dragana Kragulj IFakultet organizacionih nauka u Beogradu Privredni razvoj je veoma složen društveni proces. COBISS.SR-ID 112265484 Copyright © 2004 by Faculty of 0 rganizational Sciences. CONTENTS Knowledge based economy the base of economic growthand development Sandra Jednak, Dragana Kragulj Project management and the creation of economic policyguidelines at the s ub-national level Walter Scherrer Importance of strategic management accounting for bank management Snežana Knežević, Miloš Milosavljević, Veljko Dmitrović Budgetary changes at local level in Slovenia in crišis Uroš Pinterić Zero waste as a new concept for sustainable waste management Nataša Petrović, Sonja Išljamović, Veljko Jeremić Measuring competitiveness as a precondition of economic management Niko la Milović New paradigm of management: the commitment to innovation and sustainable competitive advantage Valentina Mašević Conceptual basis of policy of competitiveness under the conditions of the Slova k economics Jaroslava Hecčkova, Aleksandra Čapčakova, Ivana Butoracova Data development analysts and its application in education Violeta Cvetkoska Knowledge Based Economy the Base of Economic Growth and D evelopment UDK: 005.94 ; 330.341:005.336.4 Sandra Jednak, Dragana Kragulj IFaculty of Organizational Sciences, Belgrade Economic development is a complex social process. 0.5 određivanje faktora koji utiču na privredni rast i razvoj, kako oni deluju, zašto su pojedine privrede razvijenije od drugih, kao i zašto privrede imaju različite stope ekonomskog rasta predmet su izučav anja moglih studija. Determination of factors that affect the economic growth and development, the way they work, and the reasons some economies are more developed than others, and why economies have d ifferent rates of economic growth are the issues of a number of studies. 0.5

Pri analiziranju ove tematike, a prema teorijskim ekonomskog rasta, tradicionalne determinante su rad, kapital i tehnologija. Analysing these topics, and according to the economic growth theories, the traditional determinants are found to be the labour, capital and technology. 0.5

Medutin, danas se i znanje smatra jednim od faktora privrednog rasta i razvoja. 0.5 However, knowledge is nowadays considered to be one of the factors of economic growth and development as well.

0.5 Cilj zemalja Evropske unije je izgradnja ekonomije zasnovane na znanju, a samim tim i povećana uloga znanja i novih tehnologija. The aim of the European Union is to build a knowledge-based economy , and hence the increased role of knowledge and new technologies. 0.5

Ovaj rad analizira značaj znanja kao faktora ekonomskog rasta i razvoja i rezultate izgradnje ekonomije zasnovane na znanju u evropskim zemljama. 1. This paper analyzes the importance of knowledge as a factor of economic growth and development, and analyzes the results of building a knowledge-based economy in the European countries. Investments, consumption, 1. 0.5

Uvod Privredni razvoj je složen društveni proces putem kojeg svaka zemlja teži ka prelasku iz nižih u više faze ekonomske razvijenosti. Introduction Economic development is a complex social proces s s in which every country tends to ensure a passage from the lower to the higher phases of economic development. 0.5

Privredni razvoj se razmatra kao pokazatelj međusobnih odnosa makroekonomskih agregata kao što su društveni proizvod, nacionalni dohodak, zaposlenost, akumulacija, investicije, potrošnja i sl. Eco nomic development is viewed as an indicator of the relationships between macroeconomic aggregates such as social product, national income, employment, accumulation, etc. 0.5

Mada nema privrednog razvoja bez privrednog porasta (ne mora da postoji i obrnuta relacija, tj. moguć je privredni rast bez privrednog razvoja), on se ne može ograničiti samo na rast GDP-a i nacionalnog dohotka po glavi stanovnika. Although no economic development is possible without economic growth (there is no need for an inverse relation, i.e., the economic growth is possible to achieve without ut an economic development), it can be confined only to the growth in GDP and the per capita national income. 0.5

Privredni razvoj se, sem pomenutih elemenata, izražava i kroz citav skup strukturnih i funkcionalnih promena u okviru određene ekonomije kao i nizom drugih ekonomskih i neekonomskih elemenata. In addition to the above mentioned elements, the economic development can be expressed by a set of structural and functional changes within a particular economy, as well as by a succession of other economic and non-economic factors. 0.5

U tom smislu se privredni razvoj određuje kao multidimenzionalni proces. It is in this sense that economic growth is defined as a multidimensional process. 0.5

Promena ukupne društvene strukture je jedna od osnovnih komponenti privrednog razvoja i zajedno sa privrednim rastom obezbeđuje rast GDP-a i nacionalnog dohotka. The change in the overall social st ructure is one of the basic components of economic growth and together with economic growth it ensures the growth of both the GDP and the national income. 0.5

Takode, privredni razvoj je nužno usmeren ka realizaciji određenih ciljeva koje je prethodno potrebno međusobno uskladiti, a koji se mogu svesti na dva najvažnija: razvoj proizvodnih potencijala zemlje i podizanje životnog standarda stanovništva. Similarly, economic development is necessarily oriented towards achieving certain goals that have to be brought into harmony beforehand, and can be sub lined into two most important ones: the development of the economic potentials of the country and the improvement of the living standard of its population. 0.5

Š Savremena ekonomska nauka insistira na održivom razvoju (sustainable development). 59. p.306Š The modern economic science insists on sustainable development. 0.5

Pod održivim razvojem se podrazumeva samo onaj razvoj koji obezbeđuje podmirenje potreba sadašnjih generacija, ali bez ugrožavanja mogućnosti zadovoljavanja potreba budućih generacija. The sustain able development is defined as a development that ensures the satisfaction of the today's generations needs, however, without endangering the satisfaction of the future generations. 0.5

Održivi razvoj podrazumeva optimalno balansiranje između ekonomskih, socijalnih i faktora zaštite životne sredine u institucionalnom okviru. Sustainable growth means an optimum balance among t he economic, the social, and the environmental factors within an institutional framework. 0.5

On se definiše kao dugoročan, sveobuhvatan i sinergetski proces, koji utiče na sve aspekte života (ekonomski, socijalni, kulturni, ekološki i institucionalni) i na svim nivoima (lokalnom, regionalnom i g lobalnom). It is defined as a long-term, comprehensive, and synergetic process permeating all aspects (economic, social, cultural, ecological, and institutional) as well as all levels of life (local, re gional, global). 0.5

Š15Š Tri osnovna stuba održivog razvoja su: održivi ekonomski i tehnološki razvoj, održivi razvoj društva i zaštita životne sredine. 2. Š15Š The three basic pillars of sustainable development are : a sustainable economic and technological development, a sustainable development of the society and the environmental protection. 2. 0.5

Znanje kao faktor ekonomskog rasta i razvoja Mnogobrojni su faktori ekonomskog rasta i razvoja neke zemlje ili regiona. Knowledge as factor of economic growth and development There are numerous f actors of economic growth and development of a country or a region. 0.5

Figure 13: Gargantua's text output

<p>Struktura tehnološko-inovacione politike prikazana je na dijagramu 2.</p> <p>Izvor:</p> <p>Š6, str. 175E U ekonomskim uslovima Republike Slovačke, slično drugim privredama u tranziciji, tehnološko-inovaciona politika nije u potpunosti primenjena.</p> <p>Neophodno je identifikovati pravce istraživanja i razvoja u industriji u odgovarajućem programu koji se onda može upotrebiti u diferencijaciji proizvoda i procesa, a u okviru zajedničke tendencije podrške stvaranju, difuziji i primeni tehnologija i inovacija (kako se to i nameće u ekonomski naprednim privredama).</p> <p>Po našem mišljenju, programski sadržaj istraživanja i razvoja u oblasti industrije odnosi se u najvećoj meri na tri glavne oblasti S4E, S8E a to su sledeće: 1) Istraživanje i razvoj usmereni na ostvarivanje veće dodate vrednosti Cilj ove grupe istraživanja i razvoja u industriji biće da doprinesu povećanju dodate vrednosti industrijske proizvodnje u SR.</p> <p>Poželjno bi bilo iskoristiti faktore intenzifikacije kao što su istraživanje i razvoj na dugoročnom planu, tako da deo dodate vrednosti ukupne proizvodnje u prerađivačkoj industriji poraste na 35% do 2020.</p> <p>godine. 2) Istraživanje i razvoj kojim se obezbeđuje razvoj inovacija u standardu Cilj ove grupe istraživanja i razvoja u industriji biće da obezbedi veću konkurentnost domaće proizvodnje u okviru otvorenog slobodnog tržišta Evropske unije.</p> <p>Na dugoročnom planu, ono će se ogledati u sve većoj pokrivenosti domaće potrošnje domaćom proizvodnjom, posebno u industriji nameštaja, proizvodnji papira, farmaceutske industriji, proizvodnji obuće i tekstilnoj industriji za 15-20%, što znači da bi nivo pokrivenosti proizvodima domaće lake industrije (uključujući i farmaceutske industriju) dostigao 60-65%.</p> <p>Istovremeno, poželjno je da se poveća konkurentnost standardnih proizvoda prerađivačke industrije primenom inovativnih procesa. To se posebno odnosi na industriju mašina, elektrotehniku i hemijsku industriju, tako da bi se ovaj porast video na dugoročnom planu, sve do potpunog uspostavljanja ravnoteže u spoljnoj trgovini Slovačke.</p> <p>3) Istraživanje i razvoj kao podrška rešavanju globalnih problema Cilj ove grupe istraživanja i razvoja u industriji biće da se uključuje u rešavanje globalnih problema, posebno u sferi zaštite životne sredine, zdravlja stanovništva i da obezbedi održivi razvoj.</p> <p>Na dugoročnom planu, ovo znači da će se postepeno povećavati ukupni troškovi za istraživanje i razvoj, tako da bismo dostigli nivo zemalja čija je ekonomija slična našoj.</p> <p>Očekuje se da će do 2020. godine pokazatelj ukupnih troškova za istraživanje i razvoj dostići 1,5% BDP.</p>	<p>Efficiency of technological and innovation policy as a mean of improvement of economics competitiveness depends on sources, representing knowledge and research potential, including the channels of transfer and diffusion of technological progress on one hand, and on instruments stimulating the willingness of business sphere to undergo increased risk connected with innovation activities, on the other hand.</p> <p>Also balance in orientation of innovations to product- and process ones is of the same importance, what determines the way of achievement of competitive advantage (by qualitatively new utility parameters of products or by rationalization by lower production costs influencing the price of products).</p> <p>Diagram 2 shows the structure of technological and innovation policy.</p> <p>Diagram 2.</p> <p>Structure of technological and innovation policy Source: Š6, p. 175E Under the conditions of the Slovak economics, similarly as for other transforming economics, technological and innovation policy is not accomplished thoroughly by then.</p> <p>It is necessary to identify directions of industrial research and development by a program, which could be used in the process of product differentiation, within a common tendency of support of creation, diffusion and implementation of technologies and innovations (enforcing in economically advanced economics).</p> <p>According to our opinion, the program contents of industrial research and development would be focused to three main areas S4E, S8E as it follows: 1) Research and development focused to achievement of high value added The aim of the given group of industrial research and development will be to contribute to the increase of value added of industrial production in SR.</p> <p>It is desirable to utilize the intensifying factors including research and development in the long-term horizon, so that the portion of value added on gross production in processing industry to increase by 2020 to the level of 35%.</p> <p>2) Research and development ensuring standard innovation development The aim of the given group of industrial research and development will be to ensure an increase of competitiveness of domestic production within opened internal market of the European Union.</p> <p>In the long-term horizon, it would be reflected by an increase of coverage of domestic consumption by domestic production, especially in the furniture industry, paper industry, pharmaceutical industry, footwear industry and textile industry by 15-20%, what means that the level of domestic coverage in light industry (including pharmacy) would attain 60-65%.</p> <p>At the same time, it is desirable to increase competitiveness of standard commodities of processing industry by innovation process, especially of machinery industry, electrotechnical industry and chemical industry so that this increase of value could be shown in long-term horizon up to the adjustment of foreign-trade balance of Slovakia.</p> <p>3) Research and development supporting global problems handling The aim of this given group of industrial research and development shall be to join to handling of global problems, especially in the sphere of protection of living environment, health of population and ensuring of fulfillment of indicators of sustainable development.</p> <p>In the long-term horizon, it means to increase total expenditures to research and development gradually, so that we could attain the level of economically comparable countries of the EU.</p> <p>It is expected that the indicator of total expenditures for research and development could be on the level of 1,5% GDP by 2020.</p>
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Figure 14: Gargantua's html output