

UNIVERZA V LJUBLJANI  
EKONOMSKA FAKULTETA  
RAZISKOVALNI CENTER

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N o v r a z i s k o v a l n i p r o j e k t

INFORMACIJSKI SISTEMI ZA PODPORO ODLOČANJA

Nosilec projekta:

Gortan Resinovič

1. VRSTA PRIJAVE

Nov znanstveno-raziskovalni projekt

2. PRIJAVA PREDLOGA

2.1. Ime in naslov prijavitelja

Ekonomska fakulteta, Raziskovalni center EF  
Kardeljeva ploščad 17  
61109 Ljubljana

2.2. Naslov projekta

Informacijski sistemi za podporo odločanja

2.3. Odgovorni nosilec projekta

Mag. Gortan Resinovič  
Pod topoli 95  
61000 Ljubljana

2.4. Raziskovalci v projektni skupini

1. dr. J.Grad, redni profesor na področju informatike
2. dr. T. Damij, docent na področju informatike
3. mag. J.Barle, sistemski programer

2.5. Mladi raziskovalci na projektu

1. mag. V. Prašnikar
2. M. Križanovski

2.6. Bodoči mladi raziskovalci

Letno po 2 nova mlada raziskovalca.

2.7. Tuji raziskovalci na projektu

Dr. Milton A. Jenkins, Baltimore G&E Chaired Professor of  
MIS, Merrick School of Business, University of Baltimore,  
USA

2.8. Dosedanje relevantne dejavnosti prijavitelja

2.9. Mesto raziskave v mednarodnem in domačem merilu

Raziskava sodi v širše področje tistih znanstveno-raziskovalnih naporov in študij, ki obravnavajo informacijske potrebe subjektov v procesu odločanja ob upoštevanju karakteristik subjekta in uporabe sodobne informacijske tehnologije. Raziskave te vrste se intenzivno izvajajo zlasti v ZDA po objavi rezultatov znamenitih Minnesota Experiments, ki so jih sredi sedemdesetih let opravili G.B.Davis, G.Dickson, J.A.Senn, K.Kozar, N.L.Chervany, ter nato

nadaljevali M.A.Jenkins, G.DeSanctis, S.L.Jarvenpaa, J.A.Lehman in drugi. Po svojem konceptu in zasnovi predstavlja predložena raziskava Informacijski sistemi za podporo odločanja povsem originalen pristop k proučevanju informacijskih potreb za različne tipe subjektov, ki sprejemajo poslovne in druge odločitve.

Ni nam znano, da bi v našem ožjem in širšem okolju (Slovenija, Evropa) že bila izvedena oz. bila v teku izdelave takšna ali podobne študije. Na sedanji stopnji razvoja naše družbe bi bila spoznanja o subjektivnih karakteristikah ljudi, ki sprejemajo pomembne odločitve (oz. potencialnih nosilcev odločanja) in o tem, kakšne naj bi bile informacije, da bi jih ti subjekti lažje sprejeli in uporabili, strateško izredno pomembna.

#### 2.10. Najpomembnejše reference tujih avtorjev

Seznam najpomembnejših referenc tujih avtorjev je podan v posebni prilogi.

### 3. ZNANSTVENA VSEBINA RAZISKOVALNEGA PROJEKTA

#### 3.1. Znanstvene osnove projekta

Med teoretiki v behaviorističnih vedah vlada prepričanje, da ima človekova sposobnost odločanja in reševanja problemov odločilen vpliv na funkcioniranje družbenih sistemov. Naše razumevanje učinkovitosti družbenih sistemov je pravzaprav odvisno od naših spoznanj o tem, kako ljudje sprejemajo učinkovite odločitve. Po Reitmanu (v Dunnette, 1983) lahko odločanje izrazimo v obliki trikomponentnega vektorja (A,B,T). Komponenta A predstavlja neko začetno stanje, komponenta B pa končno stanje v nekem problemskem prostoru. T predstavlja transformacijo, ki je potrebna za prehod iz začetnega v željeno oz. končno stanje. Začetno stanje je stanje v katerem se trenutno nahaja nosilec odločanja, ali resursi ki so mu na voljo, ali sistem v katerem nosilec odločanja deluje. Končno stanje je tisto ciljno stanje, ki ga nosilec odločanja želi doseči, transformacija pa predstavlja procese ali akcije, potrebne za prehod iz začetnega v končno stanje.

Potreben pogoj za iniciranje procesa odločanja je razlika med začetnim in končnim stanjem. Če te razlike ni, če sta obe stanji identični, potem tudi ni potrebe po odločanju. Toda to še ni tudi zadostni pogoj za začetek tega procesa. Da bi se proces odločanja sprožil, se mora subjekt ki odloča zavedati razlike med začetnim in končnim stanjem, biti mora motiviran za razrešitev danega problema, imeti mora končno, imeti mora zmožnosti in resurse, potrebne za razrešitev problema.

Znana sta dva pristopa k proučevanju procesa odločanja, normativni in deskriptivni pristop. Normativni pristop analize odločanja je usmerjen na izbor določene akcije. Cilj tega pristopa je, da se določi takšen proces odločanja, ki naj pripelje do optimalne odločitve ali vsaj takšne, ki zadovoljuje neke minimalne zahteve.

Zaradi tega je za normativni pristop značilna zelo široka uporaba optimizacijskih algoritmov, metod in tehnik. Z deskriptivnim pristopom pa je možno proučevati anatomijo samega procesa odločanja, kar omogoča bolj adekvatna spoznanja o tem procesu v realnih razmerah. Deskriptivni pristop ima neprecenljiv pomen za analizo odločanja, ker odkriva njegove elemente in faze ter s tem omogoča boljše razumevanje narave tega procesa.

V literaturi zasledimo različne razlage procesa odločanja, vendar pa se najbolj pogosto citira Simonov model odločanja (Simon, 1960) ki celoten proces odločanja deli na tri temeljne faze: priprava, analiza, in izbor. V prvi fazi odločanja, **pripravi** na odločanje, se ugotavlja narava problema, ki je vzpodbudil proces odločanja. Potrebno je zbrati informacije, s katerimi se osvetli problem in okolje v katerem je nastal. Ko je problem identificiran in so zbrane in znane potrebne informacije, se prične druga faza odločanja, **analiza** problema. V tej fazi se problem formulira in proučuje, generirajo pa se tudi različne rešitve problema in selektirajo tiste, ki jih je v danih pogojih možno izvesti. Zadnja faza odločanja, **izbor**, obsega primerjavo selektiranih rešitev, izbor ene od možnih rešitev, in pripravo akcij za izvedbo odločitve.

Proučevanju kvalitete odločanja in učinkovitosti odločitev namenajo v razvitem svetu veliko pozornost. Utrdilo se je prepričanje da lahko le kvalitetna informacija zagotovi solidno osnovo za sprejemanje učinkovitih odločitev. To velja za odločanje tako v turbulentnih, kakor tudi v bolj umirjenih in stabilnih razmerah.

Informacija je kot temeljni resurs odločanja predmet zelo intenzivnega proučevanja, ki poteka v dveh globalnih smereh. Prva smer raziskuje relevantne lastnosti informacije in njihov vpliv na odločanje. Največ naporov se pri tem usmerja v študij popolnosti, zanesljivosti in pravočasnosti informacije, pa tudi proučevanju različnih vidikov njene vrednosti za uporabnika.

Druga smer raziskav in študij pa se ukvarja predvsem z iskanjem takih oblik in načinov prezentiranja informacij, ki bodo uporabniku olajšale uporabo informacij in omogočale polno izkoriščanje informacijske vsebine. Sem spadajo študije vpliva različnih oblik in formatov informacije na kvaliteto odločanja. V osemdesetih letih je bila izvedena vrsta raziskav, ki so proučevale učinke informacij, podanih na različne načine, n.pr.:

- tekstualen zapis v nasprotju s tabelaričnim
- detajlna informacija v nasprotju z zgoščeno
- informacija v numerični obliki v primerjavi z grafično obliko
- črno-beli zapis v primerjavi z barvnim, in podobno.

Rezultati doseženih spoznanj na teh področjih se kažejo v večji intenzivnosti načrtovanja in gradnje specifičnih sistemov, kot so ekspertni sistemi, sistemi za podporo upravljanja, informacijski sistemi za potrebe odločanja na taktičnem ali strateškem nivoju, in podobno. Ti sistemi so sposobni generirati ogromne količine internih in eksternih informacij, ter jih na različne načine med seboj povezovati, oblikovati in posredovati uporabnikom.

Značilnost vseh teh sistemov pa je, da so koncipirani nevtralnno in neosebno, kar pomeni, da ne upoštevajo osebnostnih lastnosti in komparativnih potencialov tistih uporabnikov, ki so jim te informacije namenjene. Zaradi tega se pogosto dogaja, da se velike zmogljivosti takih sistemov ne uporabljajo smotrno, vse bogatstvo informacij ki jih nudijo, pa ni dovolj izkoriščeno.

Da bi te slabosti spoznali in odstranili, je potrebno doseči premike v načinu razmišljanja pri načrtovanju in gradnji informacijskih sistemov, ki naj bi bili prilagojeni potrebam in sposobnostim različnih tipov uporabnikov informacij. To pa je možno le, če je informacijski sistem izdelan po meri uporabnika, s tem da upošteva njegove konkretne subjektivne prednosti in slabosti.

Če je informacija pasiven dejavnik, pa je človek v procesu odločanja aktiven dejavnik. Dejansko je sam proces v celoti odvisen od tega, kako se ga človek kot nosilec odločanja loti. Cela vrsta študij z različnih izhodišč proučuje človekov način spoznavanja (njegov kognitivni stil), ali pa njegov stil odločanja. Te raziskave praviloma predpostavljajo subjektivne razlike med ljudmi glede na njihov način procesiranja informacij in njihov odnos do okolja. Veliko raziskav te vrste se opira na Jungovo tipologijo, ki ocenjuje subjektivne lastnosti človeka po naslednjih kriterijih:

- 1- odnos subjekta do njegovega okolja
- 2- način, kako subjekt sprejema informacije
- 3- način, kako subjekt ovrednoti informacijo
- 4- način, kako se subjekt odloča.

Po vsakem od teh kriterijev se izoblikujeta dve možni preferenci. Preference v okviru vsakega kriterija so mutualno ekskluzivne, kriteriji pa so med seboj neodvisni. Iz tega sledi, da dobimo s kombinacijo teh 4 kriterijev (s po dvema možnima preferencama) 16 možnih tipov subjektov.

Na področju odločanja je sicer še veliko odprtih vprašanj, nedefiniranih odnosov in neraziskanih pojavov, pa kljub temu vendarle preseneča dejstvo, da doslej še nismo zasledili publiciranih rezultatov kakšne raziskave, ki bi dala odgovor na vprašanje, ali oblika informacije oz. kakšna dodana ali odvzeta dimenzija informacije (n.pr. barva) kakorkoli vplivajo na performanse procesiranja informacij pri različnih tipih po Jungu.

S predloženim projektom želimo raziskati ravno ta vprašanja. V načrtu je izvedba dveh eksperimentov. Pri prvem eksperimentu bodo udeleženci pokazali sposobnost pomnjenja informacijskih enot, sestavljenih iz besed in števil. Ker bodo nekateri kompleti teh informacijskih enot na različne načine obogačeni z barvnimi kombinacijami, bo možno iz rezultatov eksperimenta sklepati na to, ali ima barva kakšen vpliv na informacijsko percepcijo pri različnih tipih subjektov po Jungovi klasifikaciji. Pri tem bomo upoštevali samo tiste kriterije, ki jih je Jung vezal na informacijo. To sta naslednja dva kriterija:

1. način, kako subjekt sprejema informacijo. Jung loči tu dva tipa, senzitivni in intuitivni. Pri senzitivnem tipu prevladuje sprejemanje detajlnih, specifičnih podatkov iz

okolja s pomočjo čutil, medtem ko gre pri intuitivnem tipu za celovit, holističen način sprejemanja informacij z upoštevanjem hipotetičnih možnosti namesto dejanskih dejstev.

2. način, kako subjekt ovrednoti informacije. Tudi tu ločimo dva tipa, thinking in feeling tip. Za ovrednotenje z razumom, razmišljanjem (thinking) je značilen logičen, sistematičen, brezoseben pristop, pri čustvenem (feeling) ovrednotenju pa prevladuje moralističen, humanističen pristop.

Drugi eksperiment je koncipiran identično enako kot prvi, le da so informacijske enote sestavljene iz grafičnih zapisov (figur) in števil. S tem bi bila zaključena prva faza raziskav v okviru projekta Informacijski sistemi za podporo odločanja.

### 3.2. Cilji

#### 3.2.1. Namenski:

Zakovitosti procesa odločanja, ki je tipična človekova aktivnost, so v literaturi dobro poznane, raziskane in obdelane. Manj pa so znane relacije med odločitvijo in podlago za odločanje - informacijo, čeprav je splošno znano (in je tudi dokazljivo), da so zaradi slabih in pomanjkljivih informacij odločitve nekvalitetne ali napačne. Za mlado državo kot je Slovenija, ki se kot samostojen državni subjekt skuša vključevati v mednarodne gospodarske, znanstvene in kulturne tokove, in ki se šele uči, kako naj preživi in se razvija v pogojih tržnega gospodarstva in mednarodne konkurence, imajo lahko nekvalitetne, nepravilne, ali celo napačne odločitve na različnih ravneh odločanja, zelo škodljive, pa tudi katastrofalne posledice.

Subjekti, ki sprejemajo odločitve, imajo svoje subjektivne lastnosti in tudi različno - subjektivno - sprejemajo in vrednotijo informacije. Informacijski sistemi pa pripravljajo informacije enako, ne glede na subjektivne razlike med uporabniki informacij. Zaradi tega je tudi vpliv iste informacije na kvaliteto odločanja pri različnih tipih subjektov seveda različen.

Z raziskavo Informacijski sistemi za podporo odločanja želimo v prvi fazi ugotoviti, kakšna je struktura tipov potencialnih nosilcev odločanja v našem prostoru in kako se posamezni tipi odzivajo na različne informacije. Na ta način bi lahko ugotovili določene vzorce obnašanja ali celo zakonitosti sprejemanja informacij pri različnih subjektih. Ta spoznanja pa bi kasneje, v naslednjih fazah projekta uporabili pri oblikovanju osnov za načrtovanje in gradnjo informacijskih sistemov po meri uporabnika. To bi bila zadostna osnova za pilotsko študijo izgradnje sistema za informacijsko podporo odločanja, ki bi bil prilagojen konkretnemu nosilcu odločanja na izbranem položaju v našem gospodarskem ali širše družbenem prostoru. Pripomniti pa je treba, da takšna konkretna naloga presega okvire tega projekta, in bi se morala izvajati samostojno, izven tega projekta.

### 3.2.2. Objektni:

Rezultati raziskave bodo objavljeni v posebni publikaciji in poslani za objavo v ZDA (MIS Quarterly ali podobno revijo). O raziskavi in njenih izsledkih bodo raziskovalci poročali na konferenci o informacijskih sistemih v Portorožu in na enem strokovnem srečanju v inozemstvu, najbolj verjetno v ZDA.

### 3.3 Mejniki, ključni dogodki projekta

#### 3.3.1. Opredelitev pomembnih faz ali aktivnosti projekta

1. Prevod testnega materiala MBTI iz angleščine v slovenščino in prireditev tega materiala za delo v naših pogojih
2. Iskanje ponudb za računalniško opremo vrste PS/2-80 ali podobno, potrebno za izvedbo barvnih eksperimentov
3. MBTI testiranje cca. 120 subjektov. Priprava programov za izvajanje eksperimentov
4. Instaliranje računalniške opreme in programov za eksperimente
5. Izvajanja eksperimentov s cca. 120 subjekti
6. Analiza eksperimentalnih podatkov in priprava poročila.

#### 3.3.2. Program in opis dela za prvo leto

V prvem letu bi opravili prve tri postavke iz tč. 3.3.1., v drugem pa preostale tri.

#### 3.3.3. Pričakovani rezultati projekta

Iz rezultatov študije bi lahko sklepali na strukturo potencialnih nosilcev odločanja po Jungovi tipologiji (rezultat MBTI testov) in na to, kakšne informacije posamezni tipi subjektov raje sprejemajo in si jih zapomnijo. V kolikor se pokažejo kakšne zakonitosti, podkrepljene s statistično analizo, pa lahko ta spoznanja posplošimo in uporabimo pri načrtovanju in gradnji takih sistemov za podporo odločanja, ki bodo prilagojeni potrebam konkretnih uporabnikov.

## 4. RAZISKOVALNA OPREMA ZA IZVEDBO PROJEKTA

### 4.1. Obstoječa oprema

Za izvedbo raziskave ni na voljo potrebne opreme.

### 4.2. Osebna, laboratorijska oprema, ki se nabavi iz projekta

Za potrebe raziskave se mora nabaviti delovna postaja tipa IBM PS/2-80 ali podobna. Na tej opremi se bodo izvajali eksperimenti s cca. 120 subjekti, v njej bodo shranjeni rezultati raziskave in služila bo tudi za statistično obdelavo teh rezultatov. Standardnih programskih paketov (n.pr. DBMS, SPSS) ne bo treba posebej nabaviti, ker so licenčne kopije že na voljo, izdelati pa bo treba posebej programe za izvedbo eksperimentov.

5. PREDRAČUN STROŠKOV za prvo leto trajanja projekta

5.1. Število ur raziskovalcev

Raziskovalec	Ure	FTE
J. BARLE	136	0.08
T. DAMIJ	272	0.16
J. GRAD	170	0.10
M.A. JENKINS	102	0.06
G. RESINOVIČ	561	0.33
V. PRAŠNIKAR	1122	0.66
M. KRIZANOVSKI	1700	1.00
	-----	
SKUPAJ	4063	2.39
MATERIALNI STROŠKI (+20%)	813	0.48
VSE SKUPAJ	4876	2.87

5.2.1. Potovanja in strokovna srečanja

Prihod sodelavca iz ZDA M.A.Jenkinsa na pripravo raziskave  
Potni stroški za tri sodelavce na konferenci v Portorožu  
Udeležba dveh raziskovalcev (z referatom) in enega mladega razis-  
kavalca na konferenci v Portorožu.

5.2.3. Angažiranje tujih raziskovalcev in opreme

14 dnevno bivanje sodelavca iz ZDA M.A.Jenkinsa v zvezi z delom  
na raziskavi: - priprava osnovnih smernic raziskave  
- izdelava detajlnega načrta raziskave  
- priprava organizacije izvedbe eksperimentov

6. MEDNARODNA POVEZAVA PROJEKTA

Sodelovanje prof. Jenkinsa pri projektu odpira možnosti navezave  
stikov z raziskovalnimi institucijami, ki se v ZDA ukvarjajo s  
podobno problematiko. Ob interesu, ki so ga nekatere institucije  
že izrazile, obstaja možnost za pripravo skupnega -joint projekta  
in izvajanja enakih eksperimentov v obeh okoljih.

7. DOKAZILA O KVALIFICIRANOSTI

Dokazila o kvalificiranosti so zbrana v posebni prilogi

8. PREDLOG RECENZENTOV

8.1. Za recenzijo raziskave predlagamo:

1. prof. dr. W. Martin, School of Business, Indiana University, Bloomington, Indiana, USA
2. prof. dr. J. B. Pick, University of Redlands, Redlands, California, USA
3. prof. dr. S. Možina, Ekonomska fakulteta, Ljubljana.



2.2.10. NAJPOMEMBNEJŠE REFERENCE TUJIH AVTORJEV

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Bibliografijo in ostale podatke o prof. Jenkinsu bomo dostavili naknadno.

Šifra projekta

I I I I I I I I I I I I I I I

PODATKI O PROJEKTI SKUPINI, KI BO IZVAJALA RAZISKOVALNI PROJEKT  
V LETU 1992

NASLOV PROJEKTA: INFORMACIJSKI SISTEMI ZA PODORO ODLOČANJA

Odgovorni nosilec: Mag. Gortan RESINOVIČ

Zap. šte.	Šifra raziskovalca	IME IN PRIIMEK	RO/ZR	DR	F	K
1.	2188	mag. J. BARLE	EF	P	R	140
2.		dr. T. DAMIJ	ZR	Z	R	270
3.	0032	dr. J. GRAD	EF	P	R	180
4.		dr. J. A. JENKINS	ZR	Z	R	100
5.	1587	mag. G. RESINOVIČ	EF	P	V	567
.....						
MLADI RAZISKOVALCI:						
1.		mag. V. PRAŠNIKAR				1700
2.		M. KRIŽANOVSKI				1700
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Skupaj: ..... 4657

Število novih mladih raziskovalcev po letih: .. 2 .....

- Pomen oznak:
- RO - Raziskovalna ali druga organizacija
  - ZR - Zasebni raziskovalec
  - DR - Vrsta delovnega razmerja v raziskovalni organizaciji.  
Alternativa je polni delovni čas (P), nepolni delovni čas (N),  
če pa gre za honorarnega, zunanjšega sodelavca (Z)
  - F - Vloga v raziskovalni skupini: V = vodja projekta  
M = mentorski kadri  
R = raziskovalec
  - d,m,s = mladi raziskovalec (d-doktorant, m-magistrant, s-specializant)
  - K - Število ur raziskovalca na projektu

UNIVERSITY OF LJUBLJANA  
FACULTY OF ECONOMICS  
RESEARCH CENTER

Ljubljana, September 30, 1991

New research project proposal

INFORMATION SYSTEMS FOR DECISION SUPPORT

Project coordinator:

Gortan Resinovič

1. TYPE OF RESEARCH

New research project

2. APPLICATION PROPOSAL

2.1. The institutional carrier of the research project

Ekonomska fakulteta, Raziskovalni center EF  
Kardeljeva ploščad 17  
61109 Ljubljana

2.2. Project title

Information Systems for Decision Support

2.3. Project coordinator

Mag. Gortan Resinovič  
Pod topoli 95  
61000 Ljubljana

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1. dr. J.Grad, professor of informatics
2. dr. T. Damij, assistant professor of informatics
3. mag. J.Barle, systems programmer

2.5. Junior research members of team

1. mag. V. Prašnikar
2. M. Križanovski

2.6. Additional junior research members in future

Two new junior members are expected to join a team each year

2.7. Foreign researchers cooperating in the project

Dr. Milton A. Jenkins, Baltimore G&E Chaired Professor of  
MIS, Merrick School of Business, University of Baltimore,  
USA

2.9. A position of project in domestic and international scene

This research could be considered as a part of broader scientific efforts which deal with the problem of decision making information needs, taking into account personal characteristics of subjects making decision, and the use of modern information technology. Most of research efforts of this kind are held in USA particularly after a well known Minnesota Experiments were published. They were run by G.B.Davis, G.Dickson, J.A.Senn, K.Kozar, N.L.Chervany, and then continued by M.A.Jenkins, G.DeSanctis,



S.L Jarvenpaa, J.A.Lehman and others. By its concept the proposed project Information Systems for Decision Support belongs to this research environment, while taking entirely new and original approach to study information needs for different subject types.

To our knowledge no such a study was, or is being held in our narrower environment (Slovenia), or wider environment (Europe). The knowledge about the structure of personal characteristics of existing or potential decision makers, as well as knowledge of preferred type of information suitable for particular type of person, would be beneficial in current state and further development of our country.

#### 2.10. Important references of the authors from abroad

A sample of important references concerning the research is given in separate enclosure.

### 3. THE CONTENT AND EXPLANATION OF THE RESEARCH PROJECT

#### 3.1. The outline of the project

Behaviourist scientists believe that human problem solving and decision making has a decisive influence on the functioning of the social systems. In fact, our comprehension of social systems efficiency depends on our knowledge on how people make efficient decisions.

According to Reitman (see Dunnette, 1983), decision making can be expressed in a form of three-component vector (A,B,T), where A indicates the starting point, B a final state in a problem space, and T the transformation that is needed for the transition from A to B. The starting point could be:

- a) situation in which a decision maker finds himself
- b) resources, available to a decision maker
- c) system in which decision maker is operating

at the time when problem arises. Final state is the target state that the decision maker wants to achieve. Transformation consists of actions and processes needed for the transition from the starting to the final state.

For the decision process to start, a difference between starting point and final state must exist. If both states are the same, decision making is unnecessary. However this difference is not a sufficient condition for the beginning of decision making process. Some additional conditions must be given in order to start the process. These are:

- the person must be aware of the difference
- the person must have a motive for the solution to a given problem
- the person must have ability and necessary resources to reach the solution of the problem.

Two approaches for studying decision making process are known, normative and descriptive approach. Normative approach is pointed at the choice of a particular action with the objective to choose a process which leads to an optimal or at least satisfactory solution. Because of this a wide variety of optimisation algorithms, methods and technics is used in normative approach. On the other hand, descriptive approach makes it possible to study decision process itself, thus leading to a more adequate knowledge of it. By discovering its elements and processes, descriptive approach makes a great contribution to the analysis of decision making.

Many different interpretations of the decision process can be found but Simon's model (see Simon, 1960) is commonly used. According to Simon this process is made by sequence of three activities: intelligence, design, and choice. Intelligence involves the study of the nature of the problem. Information has to be gathered in order to identify it. In the design phase the problem is defined and alternative solutions are developed. In the last, choice phase, a comparison among the selected feasible solutions is made, and one of them is chosen.

The quality of decision making and efficiency of decision itself has become of great concern recently. It is believed that only an information of high quality is a guarantee for an efficient decision making. This holds both for turbulent as well as steady conditions.

As an essential resource of decision making, information is subject of intense research, held in two main directions. First group of studies searches for relevant properties of information and their impact on decision making. Among most commonly quoted are timeliness, reliability, and completeness of information. Studies of different aspects of information value is a part of research efforts in this study group.

Another group of researchers is trying to find the answer, what form and kind could make the use of information easier and enable a better utilisation of information content. A considerable number of studies in this group deals with the question, how the decision making quality could be influenced by the information forms and formats. In the eighties a number of research projects was undertaken, dealing with the impact of the information presentation on decision performance. Among the others, the following forms of presentation were most frequently used:

- text vs. tabular form
- aggregate vs. detail information
- numerical compared to graphical form
- black & white compared to colour.

As a result of this efforts an increased intensity of building some specific systems like: expert systems, management support systems, decision support systems, and similar. These systems can produce vast amounts of internal and external information, format, connect, and present them in different ways to users. Being

designed as neutral and impersonal systems they don't take into account information user personal characteristics and advantages. As a consequence, the enormous abilities of such systems are not used adequately and all possible choices of information presentation are not utilised properly.

In order to recognise and correct this weakness, a new of thinking has to be established and applied in information system development process, resulting in system that supports the abilities of end user. This can be possible if the system is built for a particular user and fit to his/her advantages and weaknesses.

If we consider information as a passive element in decision making, then human is an active one. In fact the whole process is entirely dependent on how decision maker handles it. A number of research work was done in order to discover the pattern of human cognitive style and decision making style. The difference among subjects regarding their way of information processing and attitude toward the environment is supposed. In many cases the Jung typology can be utilised. According to Jung, personal characteristics could be determined by the following criteria:

- 1- attitude toward the environment
- 2- the way how person takes in the information
- 3- the way how person evaluate information
- 4- the way how person takes decision.

Each of these criteria enables two mutual exclusive preferences. As criteria are independent, the combination of four criteria with two preferences in each of them, results in 16 different personal types.

Many unsolved questions, undefined relations, and unknown problems still exist in the field of decision making. Even so it is hard to explain why no research has been held on this problem: does information form and/or added (or taken off) information dimension such as colour have any influence on different personal types and their information processing performance.

With the proposed research project this kind of problem is addressed. Two experiments are proposed, both designed so that subjects can show their ability to remember up to 92 information elements. Some sets of information elements are enriched in different ways with colour combinations, giving us the possibility to check if the colour has any influence on information presentation by particular subject type. Only those Jung criteria are selected which depend on information. These are:

1. the way how person takes in information. Two preferences are possible, resulting in two types, sensing and intuitive type. Sensing type prefers to take more detailed and specific data from the environment through the senses. Intuitive type on the other hand prefers the complex, holistic way of taking information in, considering hypothetical possibilities instead of pure facts.

2. the way how subject evaluate information. Here too two types exist, thinking and feeling type. For evaluation with reason (thinking) the logical, systematical, and impersonal approach is significant, while for feeling type an moralistic, humanistic way of information evaluation prevails.

Information element in the first experiment is formed by couple: word and number. In the second experiment this is figure (graphic presentation) and number. Statistical analysis of experimental results will show the relationship of information form (words or figures) and information enrichment (black & white vs. colour presentation) with personality types. This will conclude the first phase of research in the proposed project.

### 3.2. The objectives of the research project

The properties of decision making (which is typical human activity) are well known, recognised and analysed. However, the relationship between the information (which is the basis for decision) and decision itself is not so clear, even it is well known that wrong and bad decisions are often based on incorrect and insufficient information. For the young state like Slovenia, which tries to enter international business, scientific and cultural environment as an independent state, while still learning how to survive and develop under the market rules and international competition, the low quality, incorrect, or wrong decisions could have some harmful or even catastrophic consequences.

People who take decision, have their own personal characteristics, which differ from other people personality. Each person takes in and evaluate information in their particular, intimate way. Information systems on the other hand produce information equally, without any concern of personal differences among end users. so the quality of decision, influenced by the same information will vary from person to person.

The aim of proposed research project is, in the first place, to get the initial knowledge of what is the structure of potential decision maker types in our environment, and then how particular subject type reacts on particular type of information. This, we hope, will give us the firm basis for search of possible patterns of subjects behaviour, or even rules, of information acceptance by particular subject type. This knowledge will later, in further development of proposed research, make it possible to set the conditions for developing user friendly information systems. This could give enough elements to build a prototype of real decision support information system, designed for the particular user, who holds the influential position in business or social environment. However, such a study is out of limits of this proposition and should be run as an independent research project.

The project results are supposed to be published in the form of working paper and send to the States (to be published in MIS Quarterly or this kind of journal). Researchers will report on

the project as well as it's results and findings on the Information Systems Conference in Portorož and one of the professional meetings abroad, most likely in the States.

### 3.3. The milestones of the project

Following is the list of project's important activities.

1. MBTI test material translated from English into Slovene and it's adaption for the Slovene environment
2. Search for the supplier of the computer equipment, HW and SW, in the range of IBM PS/2-80 or equivalent, needed to carrying on the experiments.
3. MBTI testing of some 120 experimental subjects.  
Software development for colour experiments.
4. Installation of experimental HW in SW
5. Running experiments with some 120 experimental subjects
6. Analysis of experimental data and report preparation

First three activities could be finished in the first year, while the remaining three in the second year of the research.

The results of research could help in getting the first view of personal type structure in our environment. In addition, some knowledge kind of information is better accepted and memorised by different personal types. In case some patterns or even rules of behaviour show up with statistical significance, they could be used as an important guidance in further development of user friendly information systems for decision support.

## 4. EQUIPMENT NEEDED FOR RESEARCH WORK

The existing equipment, PC XT & AT, VAX isn't suitable for running proposed experiments. Therefore a new equipment need to be installed for this purpose. It must be strong enough to carry on experiments with some 120 subjects, to store experimental results and to prepare statistical analysis on experimental data. All the SW for running experiments need to be developed.

## 5. PLANNED COSTS

The following costs are planned for the first year on the project

### 5.1. Researchers:

Total hours worked . . .	.4063	Total FTE. . .	2.39
Material costs (+20%). . .	813		0.48
Total research cost. . .	.4876		2.87

### 5.2. Travels and conferences

-one visit of research fellow from the States, including:  
acceptance of basic research concepts

preparing a detail plan for research  
preparing the organisation plan for experiments  
-three researcher take part on the conference in Portorož

#### 6. INTERNATIONAL CONNECTIONS OF THE PROJECT

Cooperation with professor Jenkins is opening some real chances to get in touch with research institution in the USA with similar research profile. Some of them have already shown initial interest for a joint project with a set of parallel experiments on both sides.

#### 7. REFERENCES OF THE PROJECT TEAM MEMBERS

A sample of references is enclosed to this proposal

#### 8. REFEREES

1. Prof.dr. W MARTIN, School of Business, Indiana University, Bloomington, Indiana, USA
2. Prof.dr.J.B.PICK, University of Redlands, Redlands, California, USA
3. Prof. dr. S. MOZINA, Ekonomska fakulteta, Ljubljana.

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The results of research could help in getting the first view of personal type structure in our environment. In addition, some knowledge kind of information is better accepted and memorised by different personal types. In case some patterns or even rules of behaviour show up with statistical significance, they could be used as an important guidance in further development of user friendly information systems for decision support.

### 4. EQUIPMENT NEEDED FOR RESEARCH WORK

The existing equipment, PC XT & AT, VAX isn't suitable for running proposed experiments. Therefore a new equipment need to be installed for this purpose. It must be strong enough to carry on experiments with some 120 subjects, to store experimental results and to prepare statistical analysis on experimental data. All the SW for running experiments need to be developed.

### 5. PLANNED COSTS

The following costs are planned for the first year on the project

#### 5.1. Researchers:

Total hours worked . . .	.4063	Total FTE. . .	2.39
Material costs (+20%). . .	813		0.48
Total research cost. . .	.4876		2.87

#### 5.2. Travels and conferences

-one visit of research fellow from the States, including:  
acceptance of basic research concepts

preparing a detail plan for research  
preparing the organisation plan for experiments  
-three researcher take part on the conference in Portorož

6. INTERNATIONAL CONNECTIONS OF THE PROJECT

Cooperation with professor Jenkins is opening some real chances to get in touch with research institution in the USA with similar research profile. Some of them have already shown initial interest for a joint project with a set of parallel experiments on both sides.

7. REFERENCES OF THE PROJECT TEAM MEMBERS

A sample of references is enclosed to this proposal

8. REFEREES

1. Prof.dr. W MARTIN, School of Business, Indiana University, Bloomington, Indiana, USA
2. Prof.dr.J.B.PICK, University of Redlands, Redlands, California, USA
3. Prof. dr. S. MOZINA, Ekonomska fakulteta, Ljubljana.

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UNIVERSITY OF LJUBLJANA  
FACULTY OF ECONOMICS  
RESEARCH CENTER

Ljubljana, September 30, 1991

New research project proposal

INFORMATION SYSTEMS FOR DECISION SUPPORT

Project coordinator:

Gortan Resinovič

## RESEARCH PROPOSAL:

### INFORMATION SYSTEMS FOR DECISION SUPPORT

This research could be considered as a part of broader scientific efforts dealing with the problem of information needs for decision making subjects. Most studies of this kind was (and still is) done in the USA, particularly after a well known Minnesota Experiments were published. By it's concept the proposed research project Information Systems for Decision Support belongs to this research environment, while taking entirely new and original approach to study information needs for different subject types.

The properties of decision making process, which is typical human activity, are well known, recognised and analysed. However, the relationship between information (as a basis for decision making) and decision itself is not so clear, even as it is well known that bad or wrong decisions are mostly based on insufficient or incorrect information.

Decision makers have their own personal characteristics which form their personality. According to this people take in as well as evaluate information in their particular, intimate way. Information systems on the other hand generate information equally, without any concern of personal differences among end users. So the quality of decision, influenced by the same information, will most likely vary from person to person.

The objective of proposed research project is

- to get the initial knowledge on the structure of potential decision maker in business and public environment, and
- to find out how particular subject type reacts on particular type of information.

We believe this will give us a good starting point for search of possible subject behaviour patterns, or even rules, concerning an information acceptance by particular subject type. This will make it possible to set the conditions for developing information systems designed on the basis of end user information needs.

The research should be held in USA and Slovenija simultaneously. Up to 150 subjects on each side should attend MBTI tests followed by two laboratory experiments. Two equal workstations will be needed (one on each side), connected to each other through computer network. For running experiments special programmes should be written, while for data analysis standard statistical packages (like SAS or SPSS) could be applied. The first phase of research could be completed in **2** years.

RESEARCH PROPOSAL:

INFORMATION SYTEMS FOR DECISION SUPPORT

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EKONOMSKA FAKULTETA LJUBLJANA

RESEARCH PROPOSAL:

INFORMATION SYSTEMS FOR DECISION SUPPORT

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Two approaches for studying decision making process are known, normative and descriptive approach. Normative approach is pointed at the choice of a particular action with the objective to choose a process which leads to an optimal or at least satisfactory solution. Because of this a wide variety of optimisation algorithms, methods and technics is used in normative approach. On the other hand, descriptive approach makes it possible to study decision process itself, thus leading to a more adequate knowledge of it. By discovering its elements and processes, descriptive approach makes a great contribution to the analysis of decision making.

Many different interpretations of the decision process can be found but Simon's model (see Simon, 1960) is commonly used. According to Simon this process is made by sequence of three activities: intelligence, design, and choice. Intelligence involves the study of the nature of the problem. Information has to be gathered in order to identify it. In the design phase the problem is defined and alternative solutions are developed. In the last, choice phase, a comparison among the selected feasible solutions is made, and one of them is chosen.

The quality of decision making and efficiency of decision itself has become of great concern recently. It is believed that only an information of high quality is a guarantee for an efficient decision making. This holds both for turbulent as well as steady conditions.

As an essential resource of decision making, information is subject of intense research, held in two main directions. First group of studies searches for relevant properties of information and their impact on decision making. Among most commonly quoted are timeliness, reliability, and completeness of information. Studies of different aspects of information value is a part of research efforts in this study group.

Another group of researchers is trying to find the answer, what form and kind could make the use of information easier and enable a better utilisation of information content. A considerable number of studies in this group deals with the question, how the decision making quality could be influenced by the information forms and formats. In the eighties a number of research projects was undertaken, dealing with the impact of the information presentation on decision performance. Among the others, the following forms of presentation were most frequently used:

- text vs. tabular form
- aggregate vs. detail information
- numerical compared to graphical form
- black & white compared to colour.

As a result of this efforts an increased intensity of building some specific systems like: expert systems, management support systems, decision support systems, and similar. These systems can produce vast amounts of internal and external information, format and connect them in different ways and present them to users.



2.2.10. Najpomembnejše reference k njihovi avtorji

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tč.2.4.

1.	dr. J.Grad	Ekonomska fakulteta	P	R	180
2.	mag. G.Resinovič	Ekonomska fakulteta	P	R	567
3.	mag. J.Barle	Ekonomska fakulteta	P	R	140

tč.2.5.

4.	mag. V. Prašnikar		Z	d	2000
5.	M. Križanovski		Z	s	2000

tč.2.6.

Letno po 2 nova mlada raziskovalca.

tč.2.7.

1. Dr. Milton A. Jenkins, Baltimore G&E Chaired Professor of MIS Merrick School of Business, University of Baltimore, USA.

tč.2.8.

Programiranje, sistemska analiza in design. Redno pedagoško delo, aktivna udeležba na seminarjih, simpozijih in kongresih, svetovanje, in raziskovalno delo na področju informacijskih sistemov, načrtovanja in gradnje sistemov za podporo odločanja, interakcije človek-stroj, pisarniškega poslovanja in komunikacij, informacijske tehnologije. Udeležba in sodelovanje pri delu AACSB Advanced Faculty Development Institut, Bloomington, Indiana, ZDA.

tč.2.9.

Raziskava sodi v širše področje tistih znanstveno-raziskovalnih naporov in študij, ki obravnavajo informacijske potrebe subjektov v procesu odločanja ob upoštevanju karakteristik subjekta in uporabe sodobne informacijske tehnologije. Raziskave te vrste se intenzivno izvajajo zlasti v ZDA po objavi rezultatov znamenitih Minnesota Experiments, ki so jih sredi sedemdesetih let opravili G.B.Davis, G.Dickson, J.A.Senn, K.Kozar, N.L.Chervany, ter nato nadaljevali M.A.Jenkins, G.DeSanctis in drugi. Po svojem konceptu in zasnovi predstavlja predložena raziskava Informacijski sistemi za podporo odločanja povsem originalen pristop k proučevanju informacijskih potreb za različne tipe subjektov, ki sprejemajo poslovne in druge odločitve.

Ni nam znano, da bi v našem ožjem in širšem okolju (Slovenija, Evropa) že bila izvedena oz. bila v teku izdelave takšna ali podobne študije. Na sedanji stopnji razvoja naše družbe bi bila spoznanja o subjektivnih karakteristikah ljudi, ki sprejemajo pomembne odločitve (oz. potencialnih nosilcev odločanja) in o tem, kakšne naj bi bile informacije, da bi jih ti subjekti lažje sprejeli in uporabili, strateško izredno pomembna.

tč.2.2.10.

Seznam najpomembnejših referenc tujih avtorjev je podan v posebni prilogi.

tč.3.2.1.

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2.	mag. G.Resinovič	Ekonomska fakulteta	P R	567
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tč.2.5.

4.	mag. V. Prašnikar		Z d	2000
5.	M. Križanovski		Z s	2000

tč.2.6.

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tč.3.3.1.

1. Prevod testnega materiala MBTI iz angleščine v slovenščino in prireditev tega materiala za delo v naših pogojih
2. Iskanje ponudb za računalniško opremo vrste PS/2-80 ali podobno, potrebno za izvedbo barvnih eksperimentov
3. MBTI testiranje cca. 120 subjektov
4. Instaliranje računalniške opreme in priprava programov za eksperimente
5. Izvajanja eksperimentov s cca. 120 subjekti
6. Analiza eksperimentalnih podatkov in priprava poročila.

tč.3.3.2.

V prvem letu bi opravili prve tri postavke iz tč.3.3.1., v drugem pa preostale tri.

tč.3.3.3.

Iz rezultatov raziskave bi lahko sklopali na strukturo potencialnih nosilcev odločanja po Jungovi tipologiji (rezultat MBTI testov) in na to, kakšne informacije posamezni tipi subjektov raje sprejemajo in si jih zapomnijo. V kolikor se pokažejo kakšne zakonitosti, podkrepljene s statistično analizo, pa lahko ta spoznanja posplošimo in uporabimo pri načrtovanju in gradnji takih sistemov za podporo odločanja, ki bodo prilagojeni potrebam konkretnih uporabnikov.

tč.4.1.

Za izvedbo raziskave ni na voljo potrebne opreme.

tč.4.2.

Za potrebe raziskave se mora nabaviti delovna postaja tipa IBM PS/2-80 ali podobna. Na tej opremi se bodo izvajali eksperimenti s cca. 120 subjekti, v njej bodo shranjeni rezultati raziskave in služila bo tudi za statistično obdelavo teh rezultatov. Standardnih programskih paketov (n.pr. DBMS, SPSS) ne bo treba posebej nabaviti, ker so licenčne kopije že na voljo, izdelati pa bo treba posebej programe za izvedbo eksperimentov.

tč.5.1.

Število ur raziskovalcev:  $887 * 150\% = 1330$   
Število ur mladih raziskovalcev:  $4000 * 150\% = 6000$

tč.5.2.1.

Prihod sodelavca iz ZDA M.A.Jenkinsa na pripravo raziskave

tč.5.2.2.

Udeležba dveh raziskovalcev (z referatom) in enega mladega raziskovalca na konferenci v Portorožu.

tč.5.2.3.

14 dnevno bivanje sodelavca iz ZDA M.A.Jenkinsa v zvezi z delom na raziskavi:

- priprava osnovnih smernic raziskave
- izdelava detajlnega načrta raziskave
- priprava organizacije izvedbe eksperimentov

tč.6.1.

tč.6.2.

tč.7.

Dokazila o kvalificiranosti so zbrana v posebni prilogi

tč.8.1.

Za recenzijo raziskave predlagamo:

1. prof. dr. W. Martin, School of Business, Indiana University, Bloomington, Indiana, USA
2. prof. dr. J. B. Pick, University of Redlands, Redlands, California, USA
3. prof. dr. S. Možina, Ekonomska fakulteta, Ljubljana.

tč. 2. 2. 10

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## Further statistical analysis

### Analysis of variance

Having observed significant differences in behaviour among groups with specific properties, we intend to make some additional statistical analysis in order to back or disprove these findings. One of questions is how the behaviour of people with strong characteristics (or strong types after Jung) fit into these findings. Till now we divided subjects according to their properties into S or N, and T or F. Now we want to split subjects not only in two groups (e.g. into S or N), but in three groups: strong S, strong N, and neutral (neither explicit S nor N).

The most difficult question is what we consider to be "strong" or "neutral" subject. Having no firm criteria for getting the answer to this question we decided to find such borders, which will allow to form three groups of roughly the same size. Using this criterion three groups were formed from the sample of subjects for the properties S/N and T/F as follows:

Group	Border	# of subj.
strong S	MBTI score < 80	39
neutral	MBTI score > 80 and < 112	35
strong N	MBTI score > 112	28
	TOTAL:	102
strong T	MBTI score < 80	38
neutral	MBTI score > 80 and < 108	32
strong F	MBTI score > 108	32
	TOTAL:	102

Analysis of variance was applied to check whether any significant difference exist among groups at a particular treatment. F-test show some significance (.021) for first set of groups (S/N) with treatment #2 and strong significance (.002) with treatment #3. In the last case group averages are 6.46, 6.97, and 8.75 for strong S, neutral, and strong N respectively. This result supports main findings of previous statistical analysis concerning groups with properties S and N, and also treatment #3.

For second set of groups (T/F) analysis of variance didn't show any significant difference in group scores for any treatment.

### Multiple regression

Relatively poor results achieved by S group versus very good results achieved by N group has opened the question of possible relationship between MBTI scores and number of hits achieved in particular treatment. Multiple regression analysis was applied for subjects of both S/N and T/F properties in order to find out if such relationship exists. As far as T/F property is concerned no relationship at all was observed for the results in any of ap-

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1. Dr. Milton A. Jenkins, Baltimore G&E Chaired Professor of MIS Merrick School of Business, University of Baltimore, USA.

tč.2.8.

Programiranje, sistemska analiza in design. Redno pedagoško delo, aktivna udeležba na seminarjih, simpozijih in kongresih, svetovanje, in raziskovalno delo na področju informacijskih sistemov, načrtovanja in gradnje sistemov za podporo odločanja, interakcije človek-stroj, pisarniškega poslovanja in komunikacij, informacijske tehnologije. Udeležba in sodelovanje pri delu AACSB Advanced Faculty Development Institut, Bloomington, Indiana, ZDA.

tč.2.9.

Raziskava sodi v širše področje tistih znanstveno-raziskovalnih naporov in študij, ki obravnavajo informacijske potrebe subjektov v procesu odločanja ob upoštevanju karakteristik subjekta in uporabe sodobne informacijske tehnologije. Raziskave te vrste se intenzivno izvajajo zlasti v ZDA po objavi rezultatov znamenitih Minnesota Experiments, ki so jih sredi sedemdesetih let opravili G.B.Davis, G.Dickson, J.A.Senn, K.Kozar, N.L.Chervany, ter nato nadaljevali M.A.Jenkins, G.DeSanctis in drugi. Po svojem konceptu in zasnovi predstavlja predložena raziskava Informacijski sistemi za podporo odločanja povsem originalen pristop k proučevanju informacijskih potreb za različne tipe subjektov, ki sprejemajo poslovne in druge odločitve.

Ni nam znano, da bi v našem ožjem in širšem okolju (Slovenija, Evropa) že bila izvedena oz. bila v teku izdelave takšna ali podobne študije. Na sedanji stopnji razvoja naše družbe bi bila spoznanja o subjektivnih karakteristikah ljudi, ki sprejemajo pomembne odločitve (oz. potencialnih nosilcev odločanja) in o tem, kakšne naj bi bile informacije, da bi jih ti subjekti lažje sprejeli in uporabili, strateško izredno pomembna.

tč.2.2.10.

Seznam najpomembnejših referenc tujih avtorjev je podan v posebni prilogi.

tč.3.2.1.

Sam proces odločanja, ki je tipična človekova aktivnost, je v literaturi dokaj poznan, raziskan in obdelan. Manj pa so znane relacije med odločitvijo in podlago za odločanje - informacijo, čeprav je splošno znano (in je tudi dokazljivo), da so zaradi slabih in pomanjkljivih informacij odločitve nekvalitetne ali napačne. Za mlado državo kot je Slovenija, ki se kot samostojen državni subjekt skuša vključevati v mednarodne gospodarske, znanstvene in kulturne tokove, in ki se šele uči, kako naj obstaja in se razvija v pogojih tržnega gospodarstva in mednarodne konkurence, imajo lahko nekvalitetne, nepravilne, ali celo napačne odločitve na različnih ravneh odločanja, katastrofalne posledice.

Subjekti, ki sprejemajo odločitve, imajo svoje subjektivne lastnosti in tudi različno - subjektivno - sprejemajo in vrednotijo informacije. Informacijski sistemi, ki te informacije pripravljajo, pa jih generirajo za vse enako. Zaradi tega je tudi vpliv iste informacije na kvaliteto odločanja pri različnih tipih subjektov seveda različen.

Z raziskavo Informacijski sistemi za podporo odločanja želimo v prvi fazi ugotoviti, kakšna je struktura tipov potencialnih nosilcev odločanja v našem prostoru in kako se posamezni tipi odzivajo na različne informacije. Na ta način bi lahko ugotovili določene vzorce obnašanja ali celo zakonitosti sprejemanja informacij pri različnih subjektih. Ta spoznanja pa bi lahko kasneje uporabili pri načrtovanju in gradnji informacijskih sistemov po meri uporabnika za pomembnejše nosilce odločanja v našem prostoru.

tč.3.2.2.

Rezultati raziskave bodo objavljeni v posebni publikaciji in poslani za objavo v MIS Quarterly. O raziskavi in njenih izsledkih na konferenci o informacijskih sistemih v Portorožu in na enem stanovskem srečanju v inozemstvu, najbolj verjetno v ZDA.