International Conference ICL
Interactive Collaborative Learning

Schola Ludus, Serious Games, and Measurement of Interestingness

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Agenda

- **Abstract. A virtual tourist intends to maximize the interestingness of the time spent during being immersed. However, the measure of interestingness is not well defined. We discuss user experience from this point of view. We propose to use measure of interestingness from virtual heritage field also in serious games for e-learning (and gamification, edutainment, and funology).**

- **Notions, time real and virtual**
- **Virtual time, real communication & interestingness**
- **How to state the problem?**
- **How to measure the interestingness?**
- **Case study – virtual museum**
- **Implications for project Comeniana**

Notions

- **Time, immersion, depth of immersion by Glassner**
- **Analyze a given minimalist example – done**
- **ICOM Definition of a Museum: A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment http://icom.museum/definition.html**
- **Definition of a Virtual Museum by Forte in Qvortrup et al. - adding "telematic collection of multimedia…"**
- **Things, people, environments * Visualization, activising, hermeneutic sites … 9 project options**
- **Real time – one past, virtual time – 2 pasts (author, user)**

Virtual time

• **Historically, the first vision of virtual time after [Qvor02] can be found in J. L. Borges. His vision in the Garden of Forking Paths describes multiple times – branching, parallel and even crossing each other.**

• **Usually, our case is much simpler, we deal with the linear (story)time. Even in this simplest case we have to distinguish two structures: event structure and discourse structure. Event structure in linear chronology is given by canonic ordering of events [Qvor01]. They can be presented in 1. canonical passage or 2. backward passage. There are three more possibilities 3. flashback, 4. flashforward and 5. embedded passage.**

• **When explaining, we preserve the canonic ordering of events. On the other hand, the user can change the settings using his or her own navigation.**

Virtual time has 2 pasts

• We preserve the canonic ordering of events. On the other hand, the user can change the settings using his or her own navigation.

• This way two past times are created (an event past in canonic ordering, and another event past in the sequence of user options). In other words, the past of events and the past of discourse may differ. From this point of view a virtual museum visitor creates his or her own version of the presentation [Came07].

• By the way, Qvortrup [Qvor02] cites a research, that the flashforward is the least understandable ordering from the above five options.

Cyberspace

"Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding."

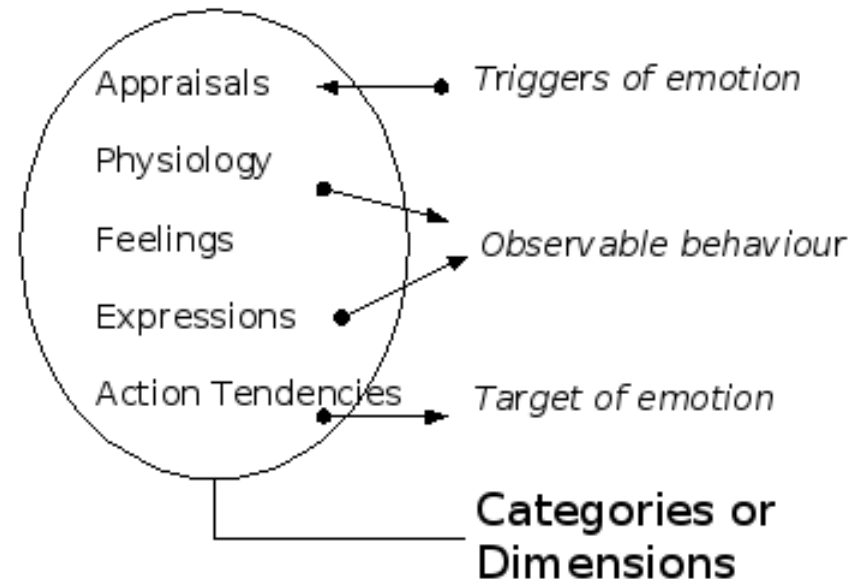Gibson, W. 1984. Neuromancer. London 1984. (CZ)

WWW & XML >> WWD

- **Million User Interface**
- **VRML, X3D, BigTable, Collada...**
- **VRML ECMA Script, VRML EAI...**
- **Time-- ...** e.g. DataMining, Adaptive Hypermedia, previews...
- **Collaborative Hypermedia,** e.g. Virtual Sculpting, MUDVR
- **MPEG-4, -7, -21, SEDRIS, CIDOC CRM...**
- 2 alternatives: **Content Age vs. Semantic Web**

Ontology Example

- **CIDOC CRM**
- **Conceptual Reference Model for Virtual Museums – entities, properties**
- **The Nose of Michael Jackson:**
- **before and after remodeling => ontology is a data model**

Ontologies Forever

- CIDOC CRM & FRBRoo – creative process ontology
- Collada 3D Conversion Solution (both geometry and radiometry, even FX), GeoVRML, CityGML/Toposcopy…
- Emotion ML 1.0 @ W3C ~ 30 use cases
- Cameron & Kenderdine
- … on Metadata/Meaning
- Importance ~ SCI, Page
- Labanotation, Bratislava 100+
- Open – comic case
- Open – best/worst views

Appraisals ← Triggers of emotion

Physiology

Feelings → Observable behaviour

Expressions

Action Tendencies → Target of emotion

Categories or Dimensions

Defining Game (Play)

- J. Huizinga: Homo Ludens
- J. A. Comenius: Schola Ludus
- Marxists: just a preparation for work
- E. Fink: Oasis of Happiness
- A. Ferko: Behavioral Mirror

- Serious Games = 21. century school

Games & Stories => 16

- **The end of computer games**
- **A. Glassner: Interactive Storytelling, p. 205**

- **Social - individual**
- **Story – no story**
- **Computer – no computer**
- **Game – no game**

Too Many VEs

- **Virtual Space 8D xyztrgba**
- **Sound Space**
- **Social Space, Game Space (rules)**
- # **Story Space (Glassner): <u>GAME</u>**
- **Knowledgescape, mindscape, inscape**
- **No time problem => interestingness**
- **ECO (emotionally-cognitive overload)**

Time... hm...

- **Qvortrup... Borges... no sensor**
- **Everybody publishes, nobody reads...**
- **The answer is blowing in the data mining community only – 9 measures of interestingness, e.g. average, extreme...**
- **Koestler? NLP?**
- **Virtual museums – engagement, enchantment – hermeneutic place**

Internet 2042

- Cybercities, WWD, Digital Libraries, Semantic Web, MPEG-7, Interactive Storytelling...

- Google Earth, MS Bing Map, CPC...

- Suitable ideas, not all addressing the ECO – emotional and cognitive overload

How to define interestingness?

- **Koestler – AH, AHA, HAHA**
- **Google, UNESCO, Webby awards, CPC**
- **Genius loci, aura**
- **E.g. Virgin Tower @ Devin Castle**
- **Digital stories, intangible heritage**
- **Enchantment, engagement**
- **Visits/visitors*duration (engagement factor by Sherwood** [Cameron-Kenderdine, 2008]

What happens before AHA?

- **Something pretty original now**
- **Appraisal theory:**
- **stimulus-arousal, adrenalin, interpretation**
- **When not sure with AHA => HM**
- **Self-observations here and now**
- **What about negative HM, levels of HM...**
- **H- (http! or towards M), hm-, hhh..., c-c-c, hmmm, mhm... aha, AHA**
- **BTW both H and M can be long and prolonged**

Prohibited love story by M. Ďuríčková

- **Rómeo&Juliet type**
- **Two lovers…**
- **… and a bad guy**
- **No happyend: 2 graves at the output side**
- **She jumps into the cruel waves of the Danube river…**
- **"The most beautiful legend of Bratislava"**

Animation by Jaro Baran
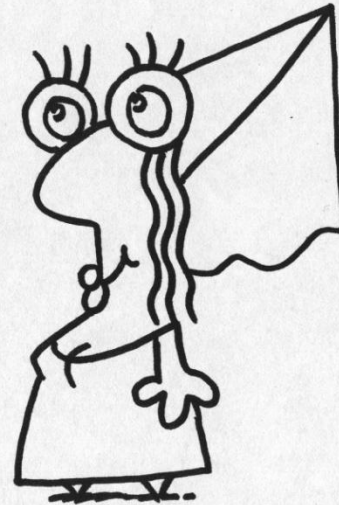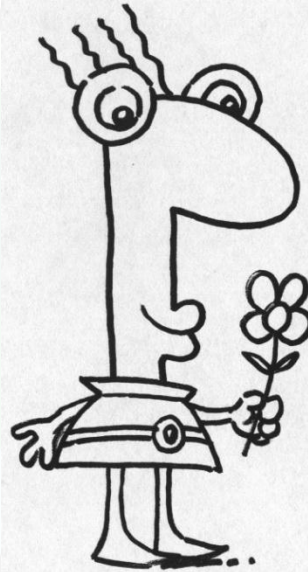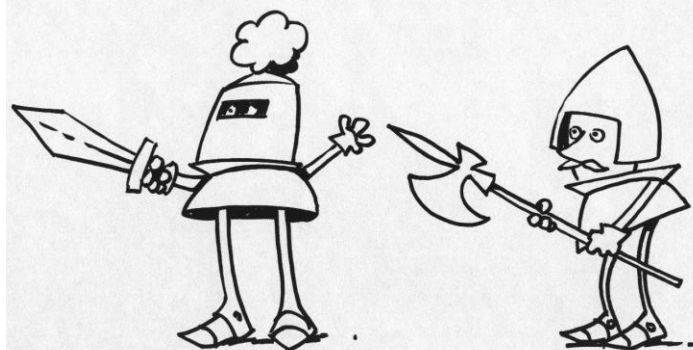
Desperate Virgin Jumping Game/VHCE

**M. Novotny,
A. Mintal,
M.Matousek,
A. Ferko**

On Model of a Human Being

- The Act of Creation (creatology):

A
S
H

AP → GS → WS

AH!

AHA!

HAHA!
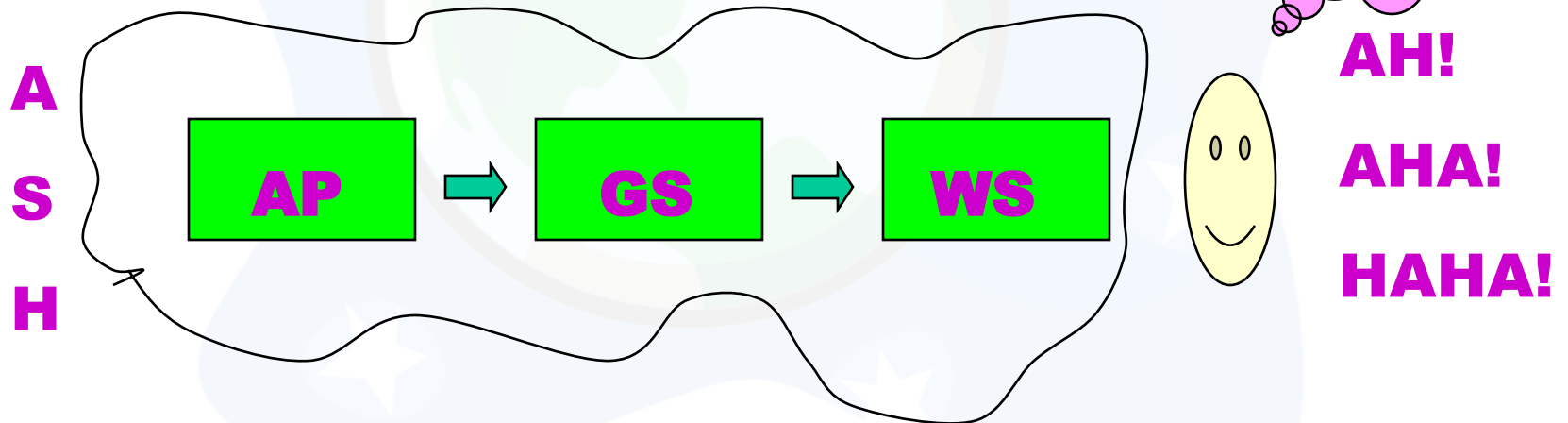
- Association >> bissociation
- Arthur KOESTLER: no labyrinth, no mouse, just bisociating two contexts

Interesting Undefined

- **In the first step we define what means interesting and using this criterion we identify the world unique dataset.**

- **UNESCO – 700+, e. g. fujara, Vlkolinec**

- **Genius loci – phenomenology**

- **Virtual heritage – CIDOC CRM... digitalization… public participation**

Genius Loci

- **Genius Loci = Spirit of the Place, LokalGeist?**
- **Etruscans – mundus, urbs, Roma**
- **Genius Loci ... Phenomenology**
- **NORBERG-SCHULZ, CH. 2000. *Genius Loci*.**
- **Implications (Hegel, Marx, Heidegger)**
- **Bogdan Bogdanovic in Vienna**

World Cultural Heritage

- **UNESCO**
- **700++ items**
- **30++ in AT, CZ, SI, SK, nearly no 3D models**
- **European added value is not added**
- **Digital preservation, documenting, publish…**
- **„… to enable Europeans to be consciously (and interactively) proud of their contribution to the World Cultural Heritage"**

VM Algorithm/Workflow

- *1. Measure of interesting -> the world unique dataset*
- *2. Data -> collect and measure*
- *3. Processing -> secondary datasets 4 presentation*
- *4. Design and implement -> HW&SW 4 interactive projected virtual reality and for internet*
- *5. Organize -> digital content 4 presentation*
- *6. Integrate and verify -> the prototype*
- *7. Produce, publish & medialize -> the solution*

- *In the case of Povazske museum, we even replaced by our virtual reconstructions the real museum during its real reconstruction.*

Keyhole into the 13th chamber

Heritage is our
legacy from the past,
what we live with today,
and what we pass on to
future generations.

Dedičstvo je náš odkaz z minulosti,
s ktorým dnes žijeme a odovzdávame
ho budúcim generáciám.

whc.unesco.org

**Heritage is our legacy from the past,
what we live with today, and
what we pass on to future generations.**

http://whc.unesco.org/en/about/

Papercraft by Martin Samuelčík
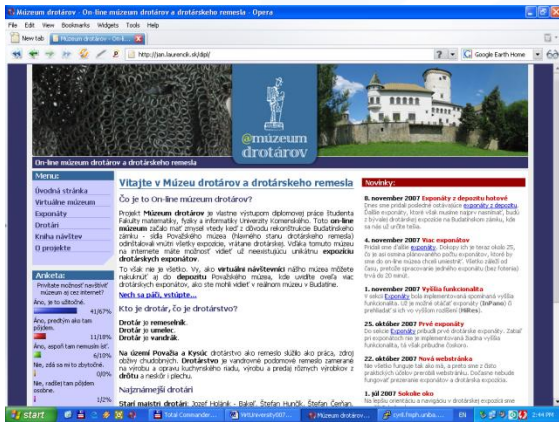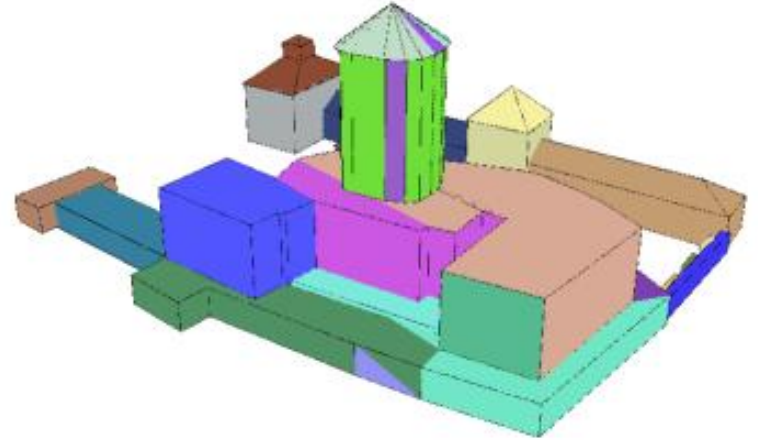
Produce, publish

- *Seventh, we publish the solution. In the case of Povazske museum, we even replace by our virtual reconstructions the real museum during its real reconstruction*

Brhlovce Case Study

Diploma work, MSc. Thesis by Rastislav SVARBA

Brhlovce cave houses virtual museum
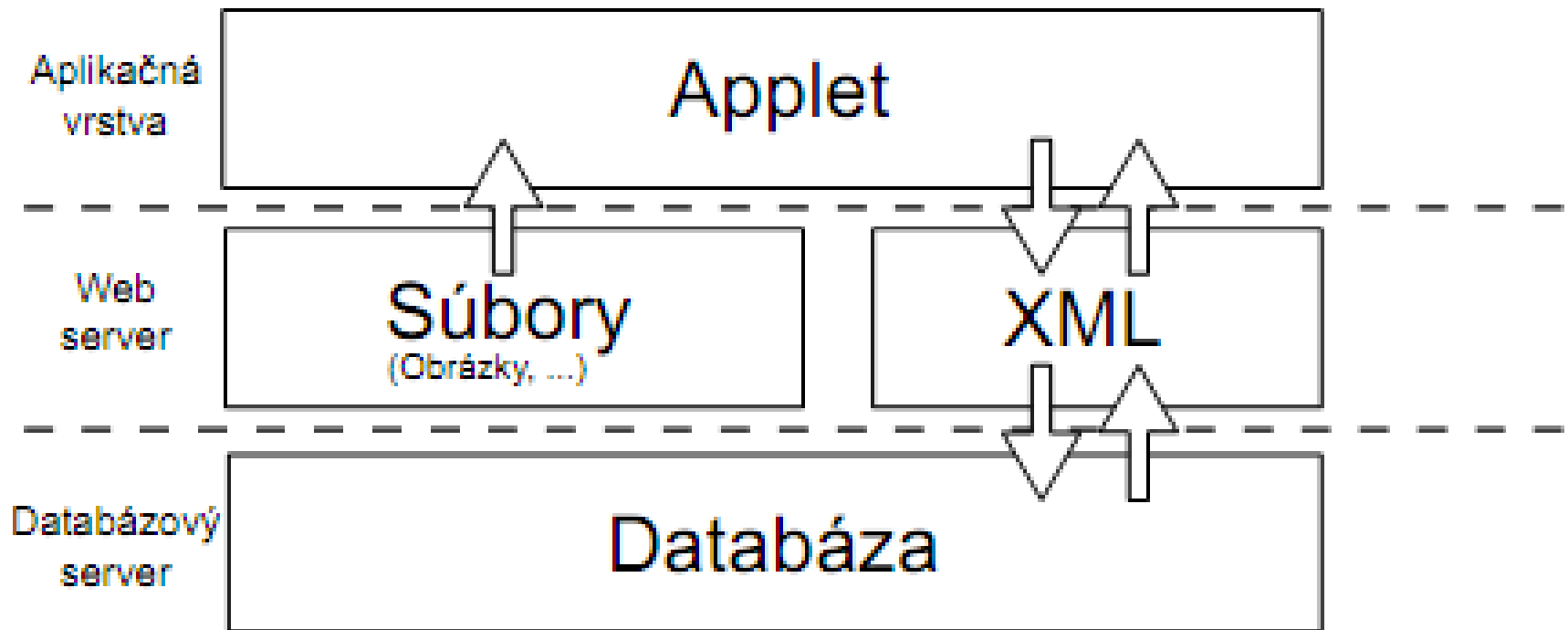
http://brhlovce.ra100.net
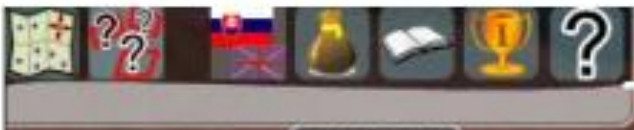
horný panel

rozšírenie
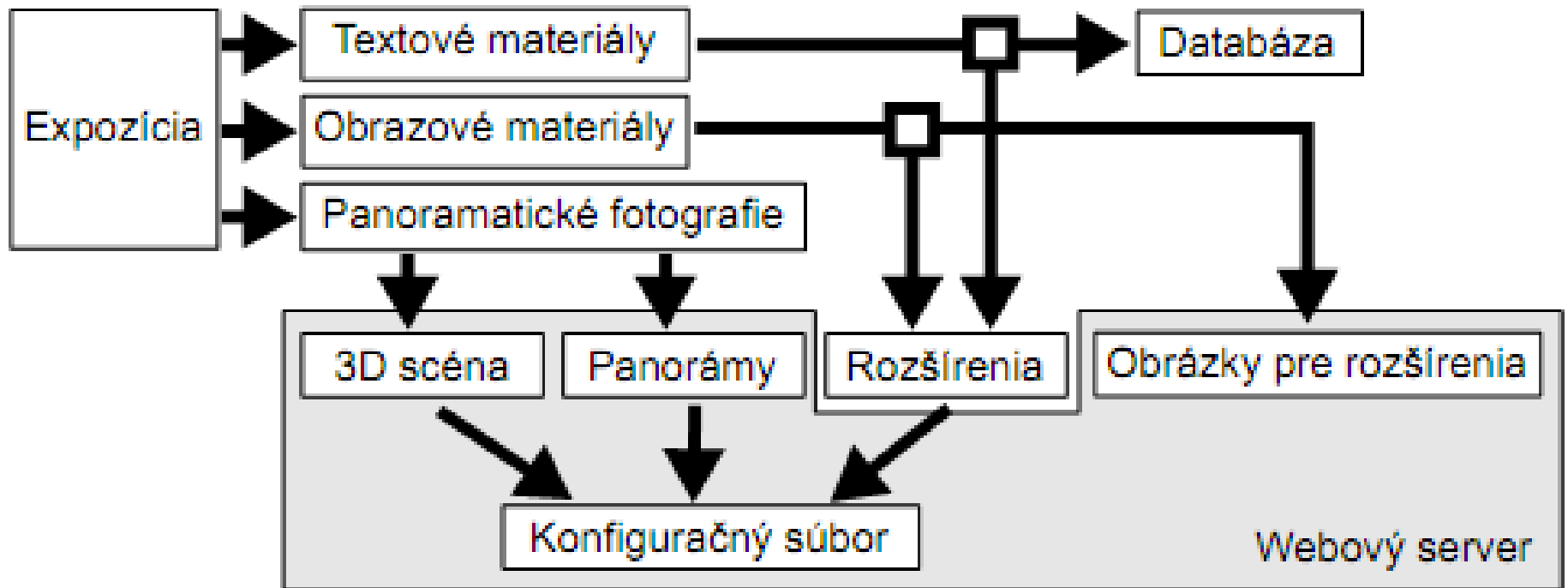
mapa

V-Brhlovce Context Diagram
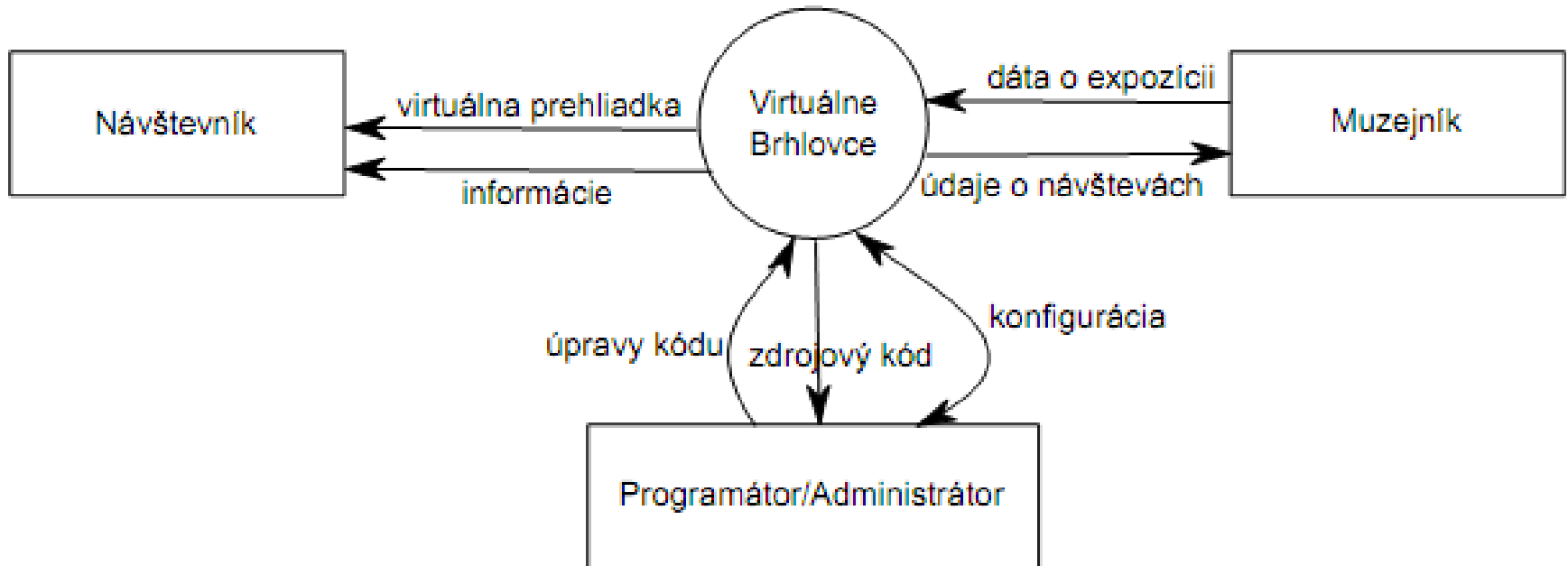
Architecture
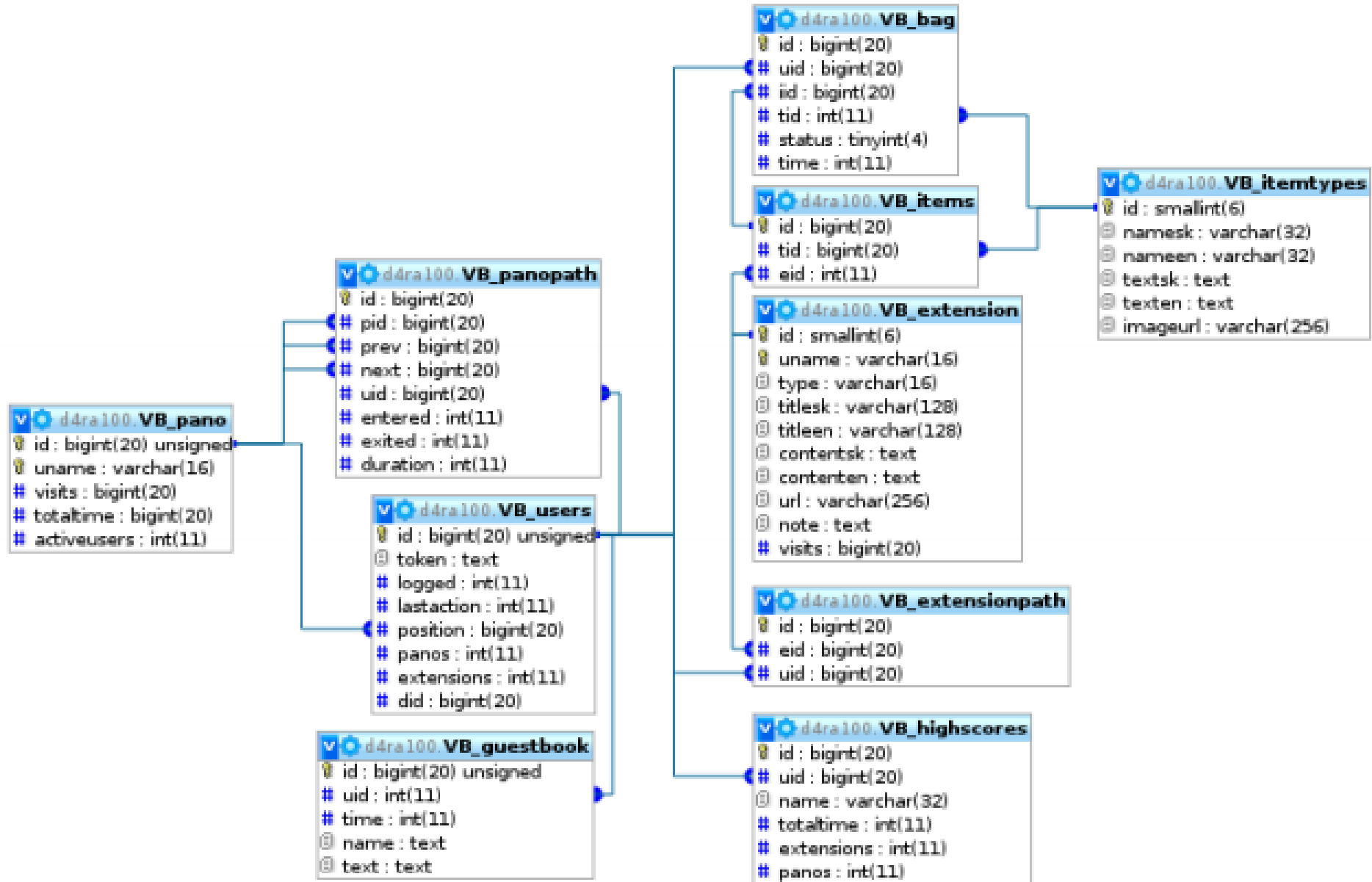
Primary/secondary data

Skalné obydlia

Výnimočný príklad toho, ako človek dokázal využiť prírodné danosti vlastného životného prostredia, sú skalné obydlia v malej hontianskej dedinke Brhlovce v Levickom okrese. Tretohorný sopečný tuf tvoriaci geologické podložie aj tunajšieho chotára umožnil obyvateľom obce vysekať a do mäkkej skaly nielen hospodárske no tiež obytné priestory svojho domova. Brhlovce (prvá zmienka z r. 1245) zo svojej dlhej histórie odvodzujú ústnym podaním dobu tureckých vojen za čas vzniku takýchto nezvyklých obydlí. Ako prvý ich opísal až Matej Bel v r. 1742 vo svojich Notitiach. Na kameň stvrdnutý sopečný popol umožnil vysekať príbytky do južného svahu Šurdy a Dolnky. Tunajším kamenárom poslúžil ako materiál z ktorého vyrezali nespočetné množstvo kvádrov na stavbu domov či klenby vinných pivníc, zárubne okien, dverí, schody, stĺpy gánkov i vrát, vstupné bránky pre sedliacke usadlosti mnohých hontianskych a tekovských obcí. Náhrobky z brhlovského kameňa sa dodnes nachádzajú na katolíckych, protestantských i židovských hroboch ba cintorínoch v širokom okolí. Kamenárskemu umeniu sa Brhlovčania prvučili u talianskych majstrov, ktorí postavili tunajší neskorobarokový kaštieľ (z r. 1756) a katolícky kostolík vedľa neho.

V roku 1983 slovenská vláda svojim uznesením č. 272 vyhlásila skalné obydlia v brhlovskej Šurde a Dolnke za pamiatkovú rezerváciu ľudovej architektúry. Tekovské múzeum v Leviciach tam v júni 1992 sprístupnilo verejnosti svoju vysunutú expozíciu ľudového bývania v usadlosti č. 142, kde ešte do roku 1988 žila rodina Ladislava Horňáku. Usadlosť má na konci dvora vysekané do skaly priestory až v 2 podlažiach (asi pol. 18.-začiatok 20. storočia), po stranách dvora stoja z kameňa vymurované domy. Menší je z 80-ych 18. storočia, väčší je datovaný na priečelí r. 1860, zadnú izbu postavili až v 30. rokoch. Pôvodne tu žili až tri rodiny v spoločnom dvore. Obytné miestnosti domov (pitvor, kuchyňa, izby) aj letné kuchyne v skale sú zariadené tak, aby hodnoverne priblížili atmosféru živej domácnosti a ukázali vývoj bytovej kultúry obyvateľov Brhloviec i širšieho regiónu Tekova a Hontu v priebehu 20. storočia. Vybavenie hospodárskych priestorov (komora, maštaľ, kamenárska dielňa) aspoň v náznaku priblížuje tradičný spôsob obživy Brhlovčanov.

Za záchranu domova a ďalšie adekvátne využitie tejto výnimočnej pamiatky ľudového staviteľstva dostalo Tekovské múzeum v roku 1993 svoju trvalú expozíciu Skalné obydlia v Brhlovciach medzinárodné ocenenie bronzovú plaketu EUROPA NOSTRA.
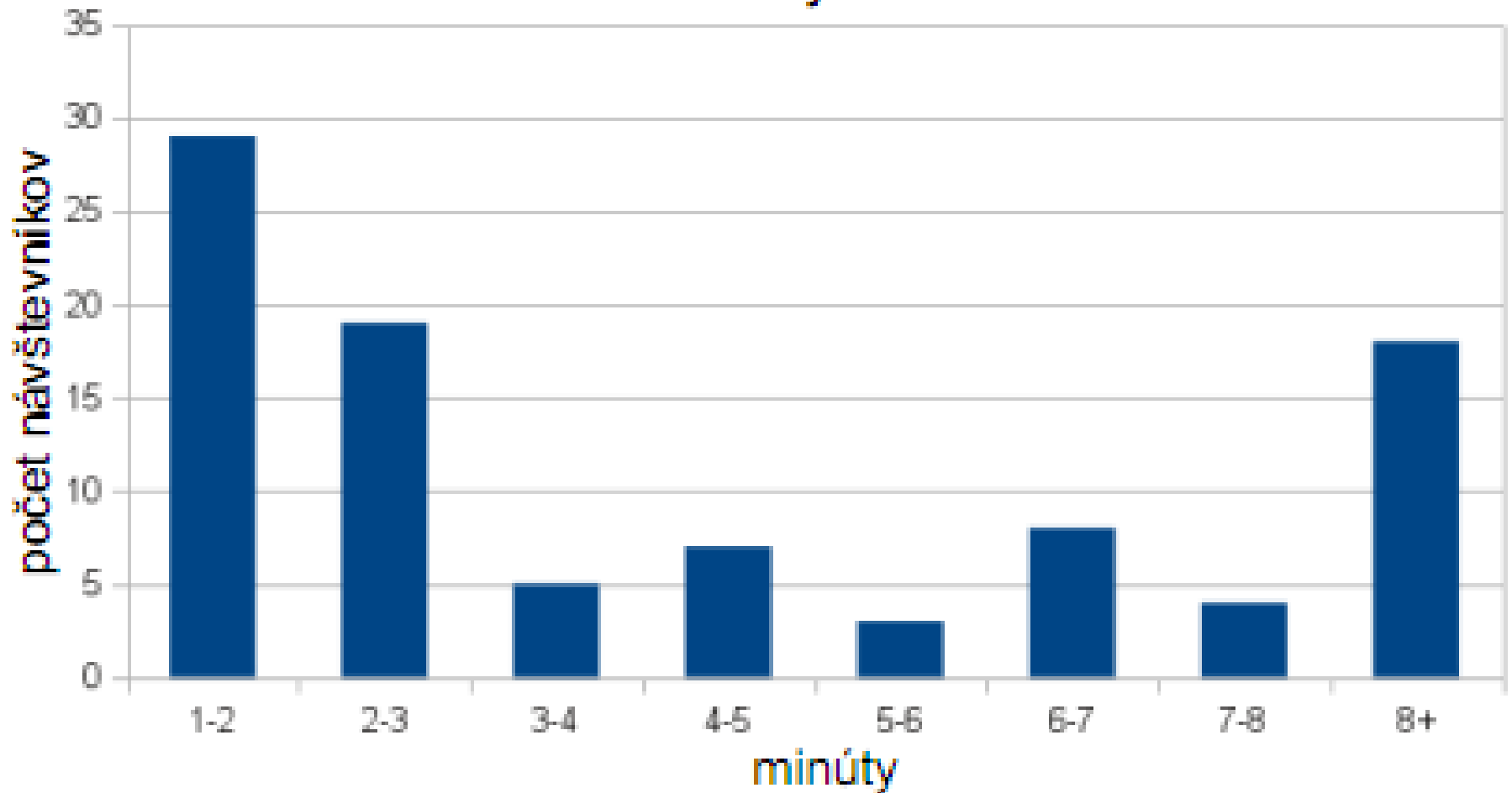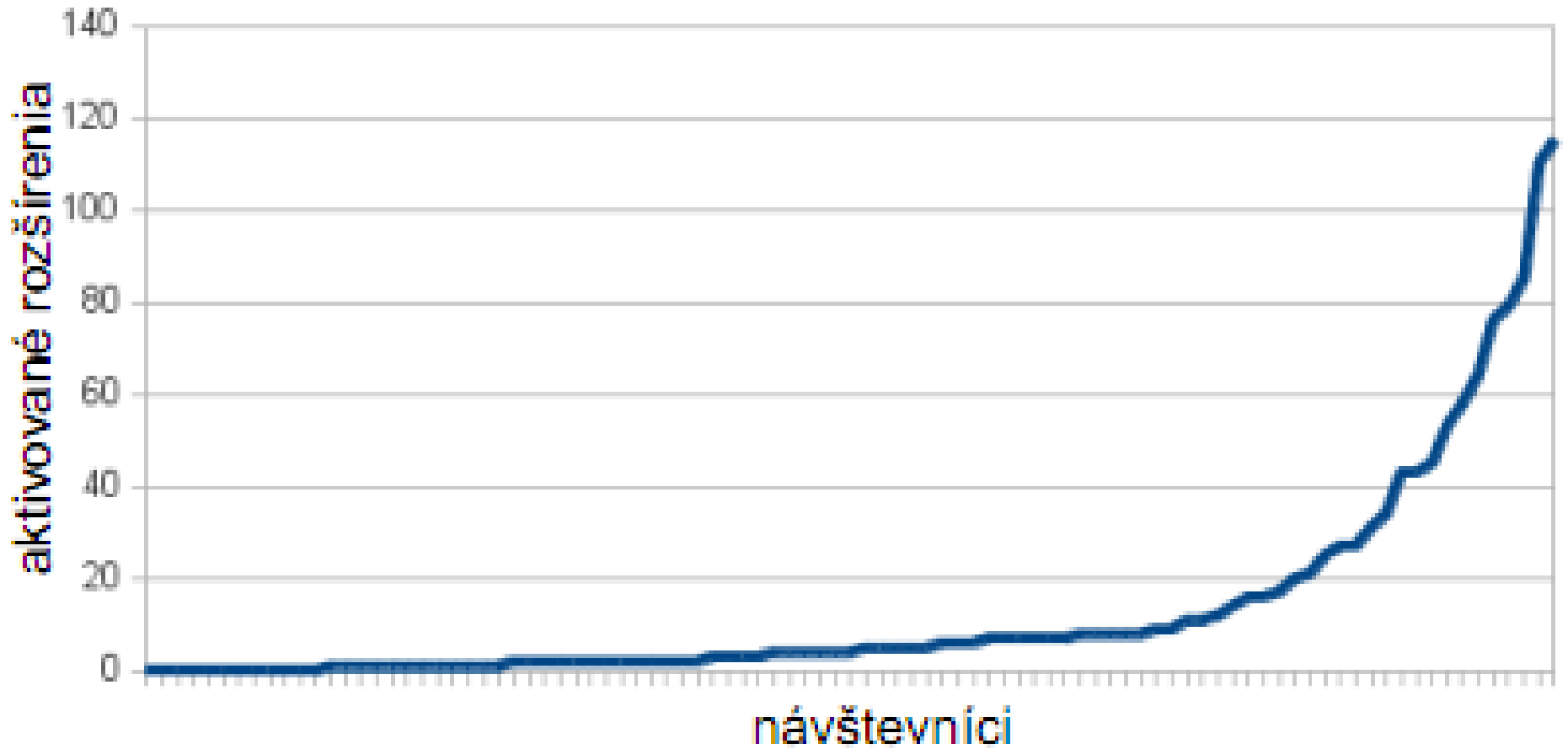
Quantitative Evaluation
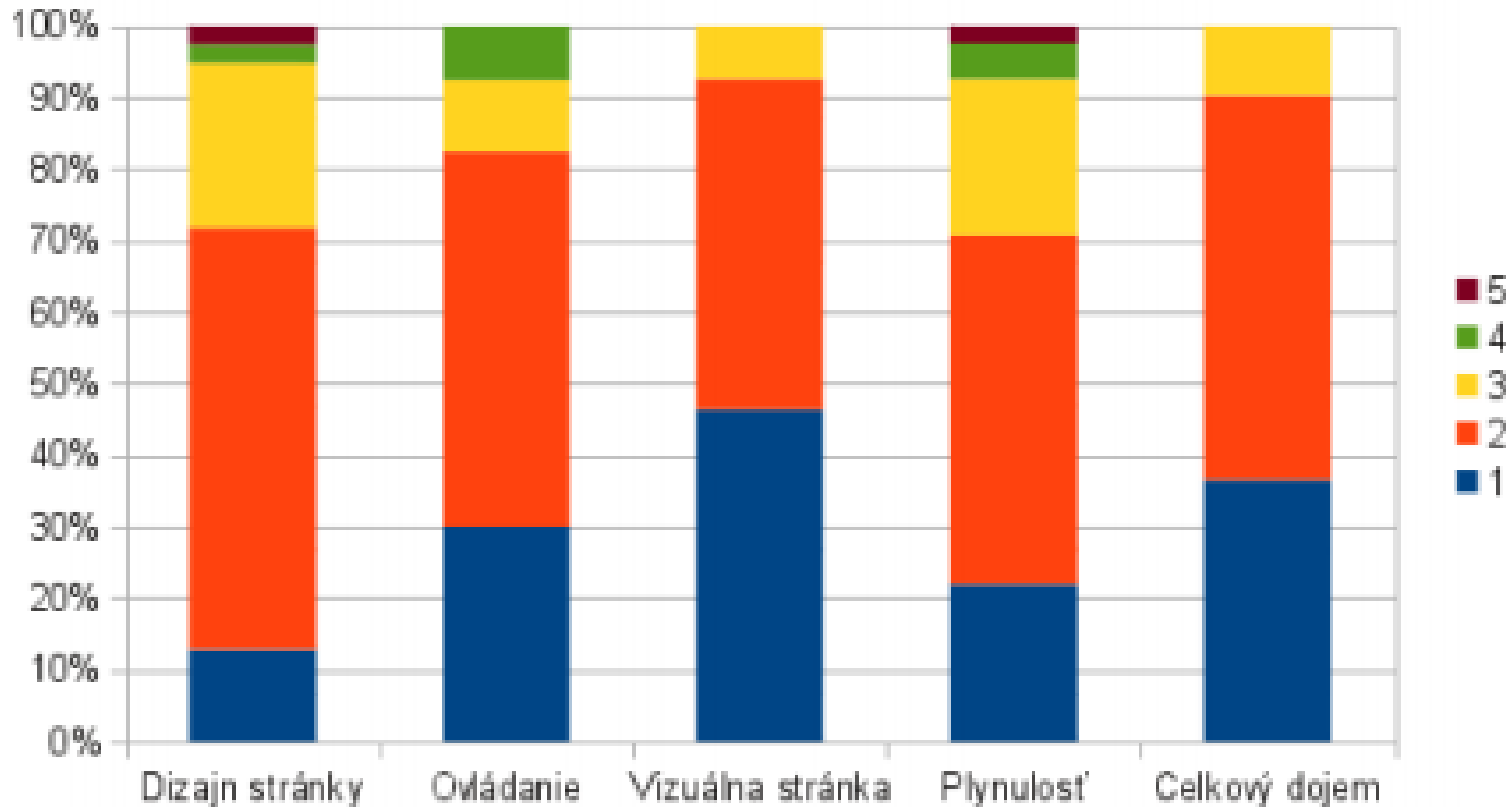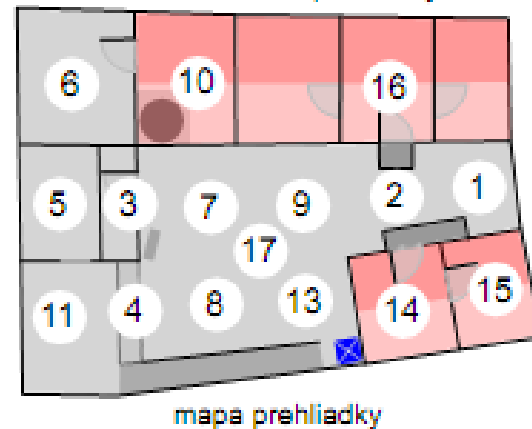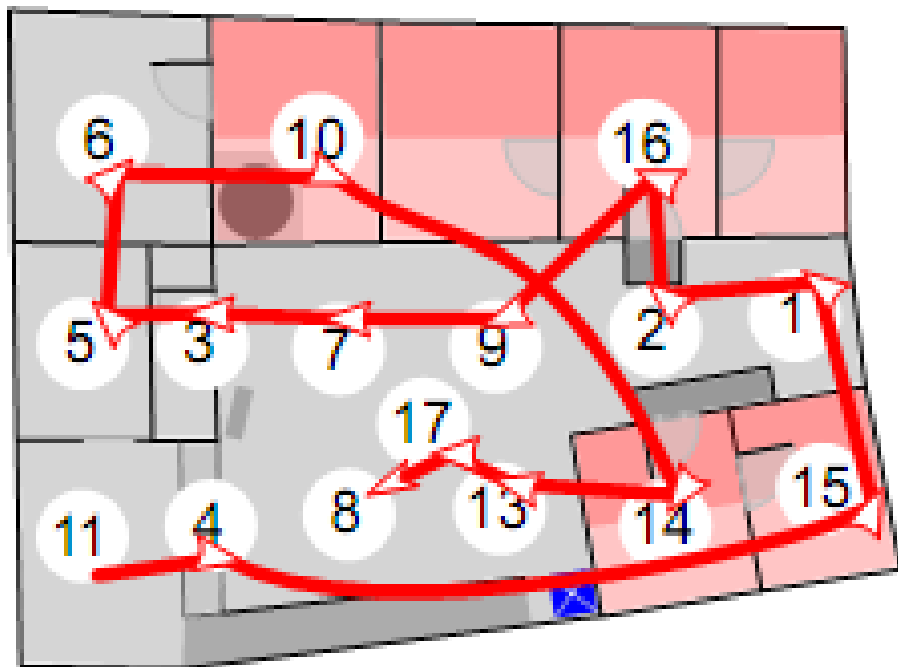
Feedback on Design/Use
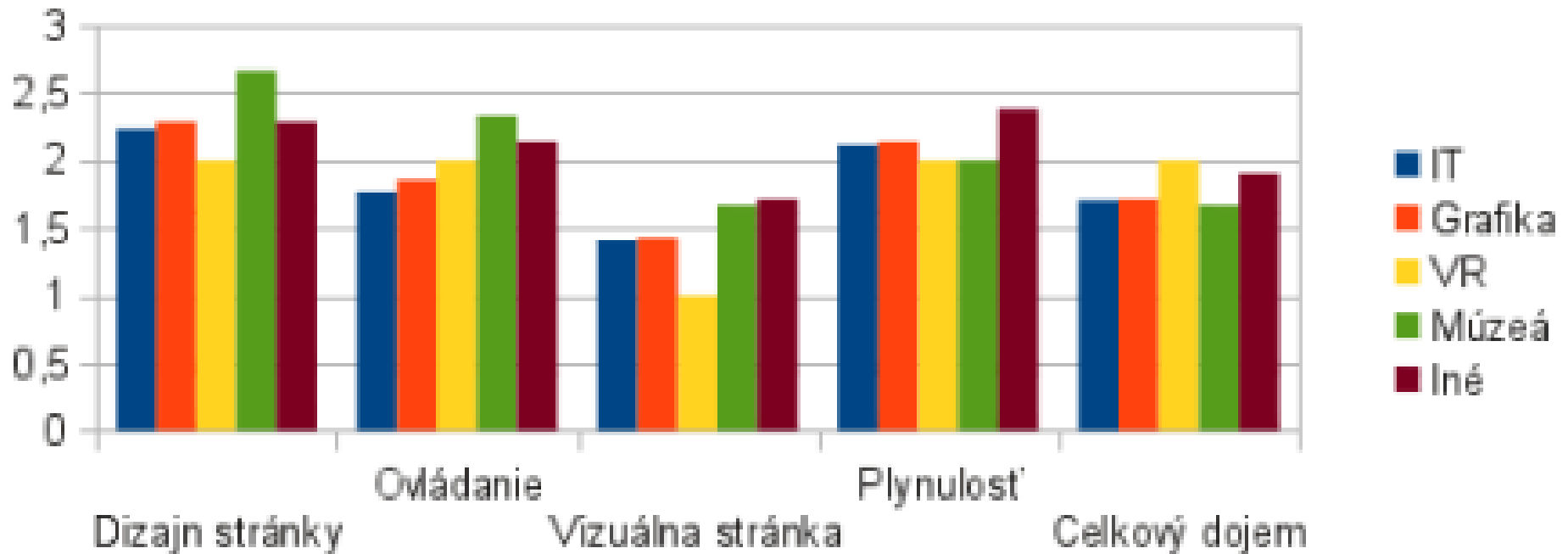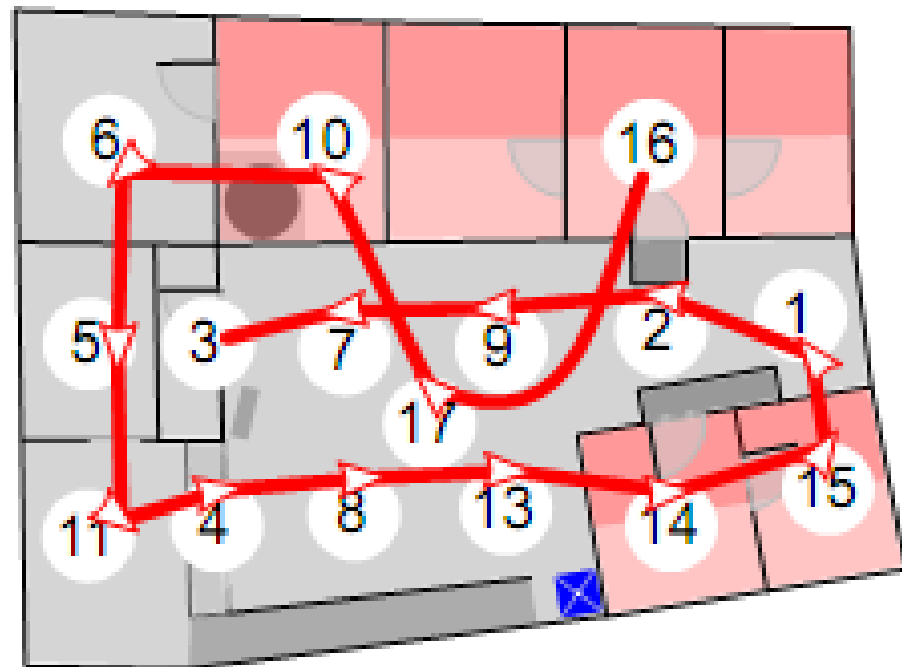
Visit Duration

Celkový čas

Extension Activations

Visiting Panoramas

Celkový čas

Priemerný čas a počet rozšírení

Počet návštev

mapa prehliadky

Preferred Story


z východzieho bodu

ku koncovému bodu

Winning Activations

Selected Statistics++

- Research&development Oct 2009 to March 11, 2011, about 6000 lines, Linux, FOSS

- Cyd Virtual Tour na Google Code

- (http://code.google.com/p/cyd-virtual-tour)

- 1534 photos, 2.3 GB, dát, 749 HDRi's, 1.5 GB,

- Panoramas, 11.1 MB, 77 extensions, 4.1 MB

- 3D model, VRML97, 680 KB, compressed 122.6 KB

- Total data volume (without DB), server, 24.3 MB

3D Model & Spheric PanoViews
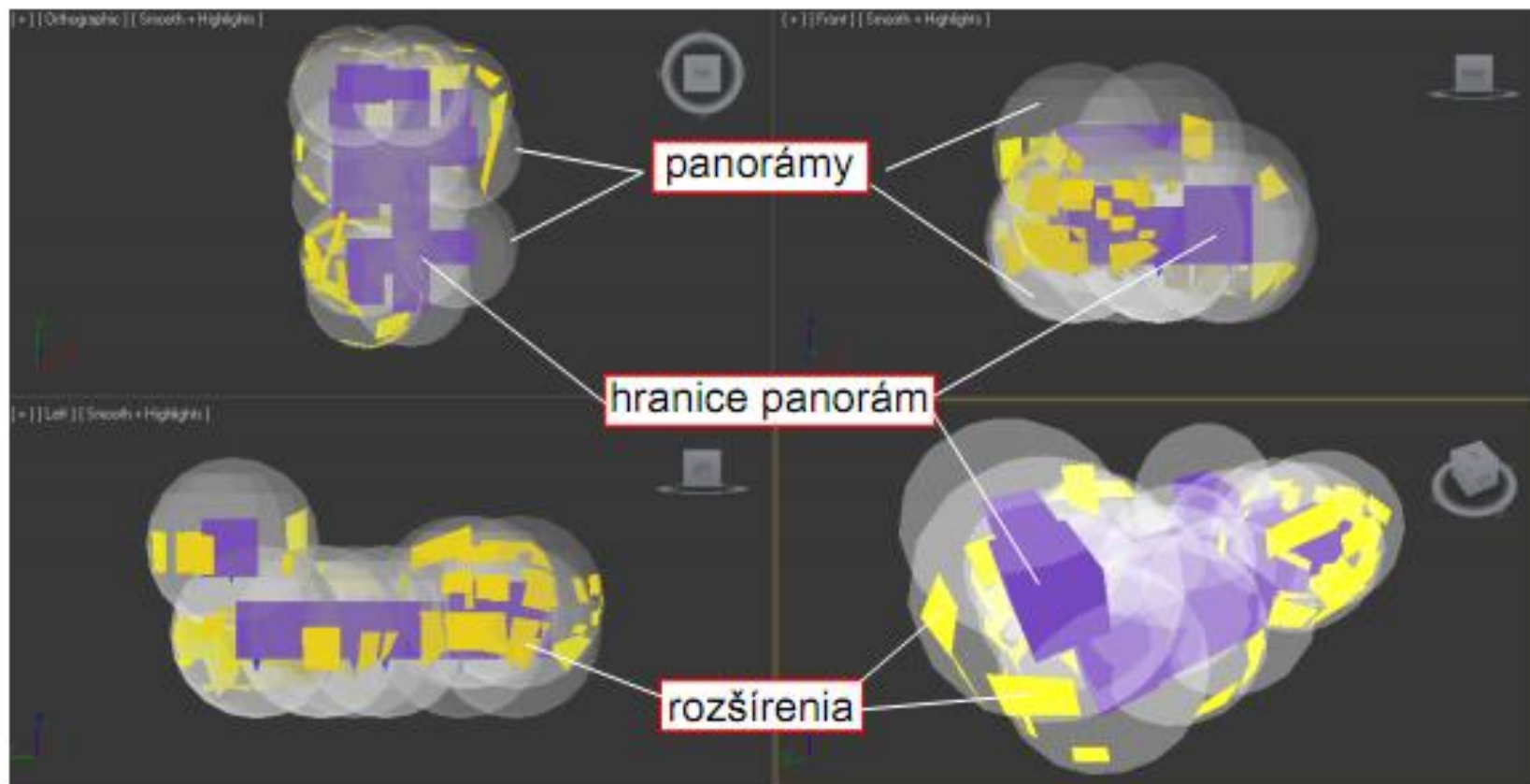
Acknowledgements

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- **Pracovníci Považského múzea**
- **Pracovníci Mestského múzea Bratislava**
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- **EUROSENSE Slovakia, aerial images**
- **Prover, Centaur, Vis Gravis**
- **Didaktika vyučovania počítačovej grafiky, grant UK**
- **VEGA No. 1/0763/09**

Conclusions

- **Virtual time is controlled first by the author (materialist, idealist, or phenomenology)**
- **Our cultural capital: static/dynamic, Q/A, A/B**
- **Our goal – maximum in 16 activities…**
- **… as the only true property we really have is the time of our lives**
- **Therefore we propose to utilize virtual museum quality measure for serious games**

Thank You

- **For Your Attention**

... and Time

- **... Time (past, now) and future:**

- **http://brhlovce.ra100.net**

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