



# ENTREPRENEURSHIP & ARCHAEOLOGICAL HERITAGE

HERISTEM PROJECT SEMINAR  
JUNE 3-4, 2022  
FACULTY OF PHILOSOPHY, BELGRADE

ORGANIZERS:

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# HERISTEM Project & the issue of entrepreneurship

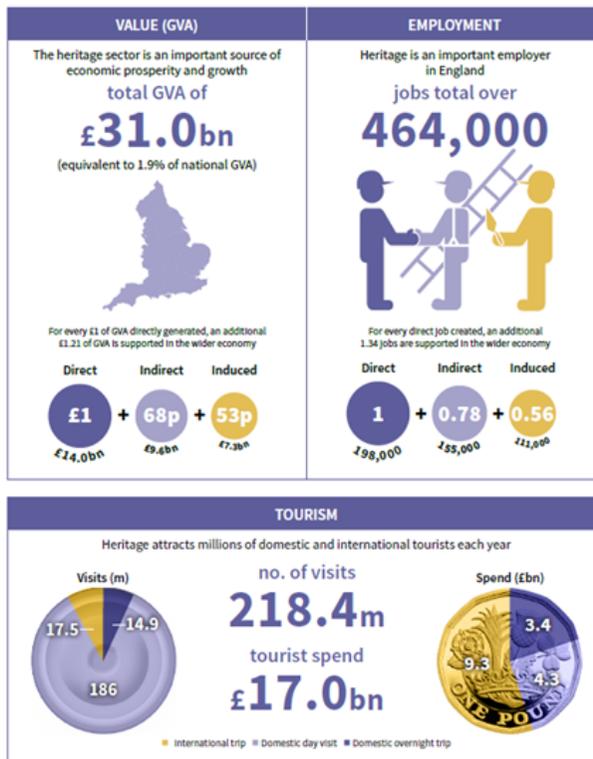
Predrag Novaković

The global heritage tourism market was valued at USD 556.96 billion in 2021 and is expected to expand at a compound annual growth rate (CAGR) of 3.8% from 2022 to 2030. The growth is substantially driven by the initiatives taken by the governments to promote culture in the tourism industry.

The growth of global heritage tourism is accelerated by the increasing interest in cultural travel. According to the United Nations World Tourism Organization, about 40% of all global tourism accounts for cultural and historical travel.

(<https://www.grandviewresearch.com/industry-analysis/heritage-tourism-market-report>)

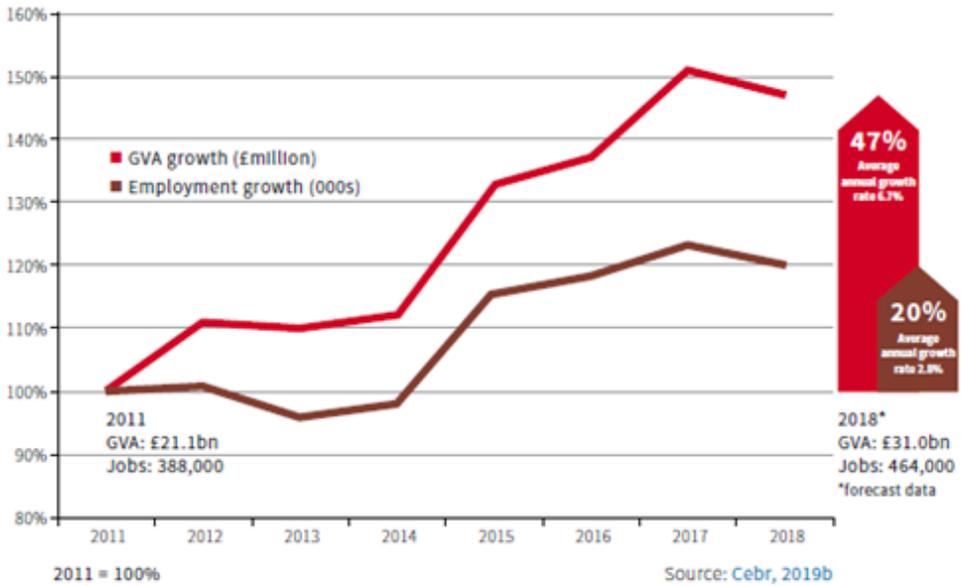
## HERITAGE AND THE ECONOMY 2019 England



Source: (Cebr, 2019)

Fig. 1 Heritage and economy; the case of England in 2019.

# Heritage a vital and growing part of our national economy



## England's heritage sector direct GVA comparison with selected UK industries in 2018 (£millions)



Fig. 2 Data from Heritage and Economy, 2019, Historic England; see: <https://historicengland.org.uk/content/heritage-counts/pub/2019/heritage-and-the-economy-2019/>.

## The major change in archaeological practice

Since the 1980s, first in the UK and later in many other European countries, archaeology rapidly increased in size, number of projects, funding, employment and working tasks. The principal reason was the unprecedented rise of the preventive archaeology and polluter-pays principle. However, each country developed a different business model for meeting the challenge of increased preventive works, from commercial (market-oriented) to public or semi-public models.

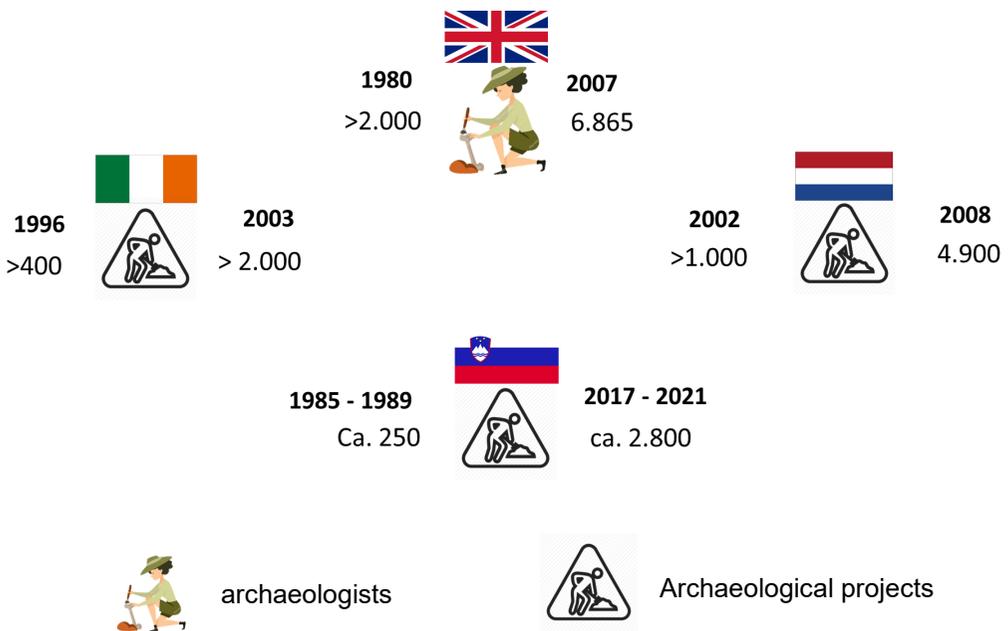


Fig. 3 Rapid growth of archaeology in the last 3-4 decades. Source : P. Depaepe (2016, 37), and Novaković, Hornak (2016, 28) In: P. Novaković, M. Horňák, M– P. Guermandi, Harald Stäuble, P. Depaepe and J.P. Demoule (eds.), *Recent Developments in Preventive Archaeology in Europe*. Ljubljana 2016; *Arheologija v letu 2017, 2018, 2019, 2020, 2021*.

However, to commercialise heritage by promoting its positive values, the first step is **research** and **protection**, archaeological heritage included.

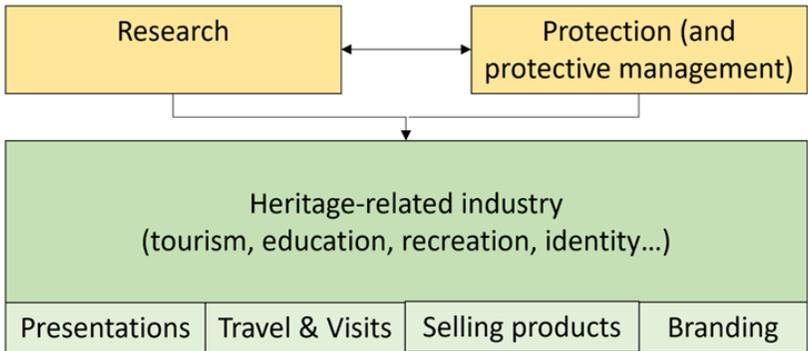


Fig. 3 Most frequent domains of involvement of private organizations in archaeology.

In each domain of working with heritage, jobs are created in public and private organizations (depending on national legal frameworks and business environment and practice. Private organizations are considered all non-public organizations (commercial enterprises, NGOs, civil societies, etc.

### Entrepreneurship in archaeology

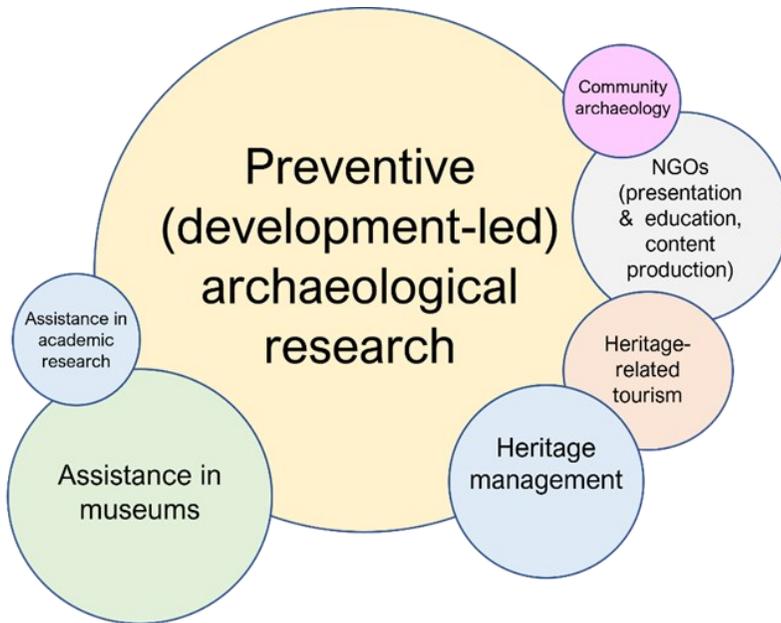


Fig. 4 Most frequent domains of involvement of private organizations in archaeology.

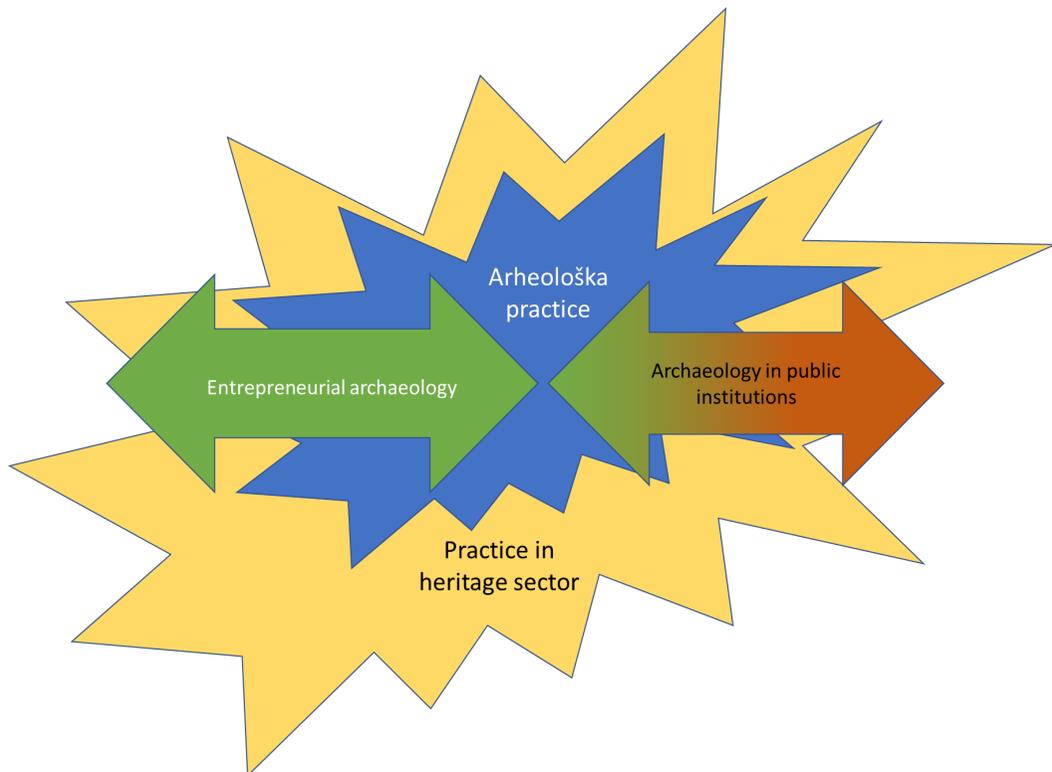


Fig 5. Archaeological institutionalized practice.

„Entrepreneurial“ (field) archaeology	Archaeology in public institutions
1 Small to extremely large projects	1 Small scale (low-budget) projects dominant
2 Fluctuating income	2 Stable but limited funding
3 Large number of junior staff; low(er) paid jobs	3 Limited opportunities for junior archaeologists (for smaller number)
4 Security of jobs smaller	4 Security of jobs greater
5 Service-providing-oriented; limited research choices; routinization	5 Autonomous but fragmented research/museum work
6 Embedded in local/national context	6 International networking
7 Less control of external conditions	7 More control over extern. conditions
8 Considerable experiences in „business“ of archaeology & capacity for adaptation	8 Less prone to changes, smaller capacity for adaptation

Fig 6. Major differences between entrepreneurial archaeology and archaeology in public institutions.

Entrepreneurship in archaeology is still very much limited to the specialist domains (archaeology, conservation, heritage protection and presentation. In the future, great potential lies in the creative industry, which expands traditional specialist domains.

<i>Groups of creative people</i>	<i>Occupations (ISCO-Code)</i>
<i>Creative core</i>	Physicists, chemists, and related professionals (211); Mathematicians, statisticians, and related professionals (212); Computing professionals (213); Architects, engineers, and related professionals (214); Life science professionals (221); Health professionals (except nursing) (222); College, university, and higher education teaching professionals (231); Secondary education teaching professionals (232); Primary and pre-primary education teaching professionals (233); Special education teaching professionals (234); Other teaching professionals (235); Archivists, librarians, and related information professionals (243); Social sciences and related professionals (244); Public service administrative professionals (247).
<i>Creative professionals</i>	Legislators, senior officials, and managers (1); Nursing and midwifery professionals (223); Business professionals (241); Legal professionals (242); Physical and engineering science associate professionals (31); Life science and health associate professionals (32); Finance and sales associate professionals (341); Business services agents and trade brokers (342); Administrative associate professionals (343); Police inspectors and detectives (345); Social work associate professionals (346).
<i>Bohemians</i>	Writers and creative or performing artists (245); Photographers and image and sound recording equipment operators (3131); Artistic, entertainment, and sports associate professionals (347); Fashion and other models (521).

*Create “new ideas, new technology and/or new creative content” (Florida 2004, 8). Occupations in science and engineering, architecture and design, education, arts, music and entertainment”.*

*Working in “business and finance, law, health care and related fields” (ibid.), engage in complex problem solving that involves a great deal of independent judgment and requires high levels of education” (ibid.)*

*Individuals in cultural and artistic occupations; part of the creative class, and they reflect an urban culture of tolerance; play a key role in attracting the two other categories of the creative class.*

Fig. 5 from Richard Florida, *The Rise of Creative Class*, 2004, p.8.

# Overwiev of entrepreneurship in Slovene archaeology

Matjaž Novšak

## Main facts

<b>Population</b>	2,05 mil.
<b>Territory</b>	20.273 km <sup>2</sup>
<b>GDP</b>	42 bil. €
<b>Construction sector annual turnover</b>	4,2 bil. €
<b>Preventive archaeology annual turnover</b>	7,2 mil. €
<b>A) Public sector</b>	3,5 mil. €
<b>B) Private sector</b>	3,7 mil. €
<b>% of preventive archaeology in spatial development investments</b>	0,17%

<b>Archaeologists</b>	201
<b>Public institutions</b>	138
<b>Private organizations</b>	63
<b>Conservators (monitoring)</b>	13

## Principal legal framework:

- La Valletta Convention ratified (1999)
- Law on Protection of Cultural Heritage (2008)
- Regulations on archaeological research (2013)

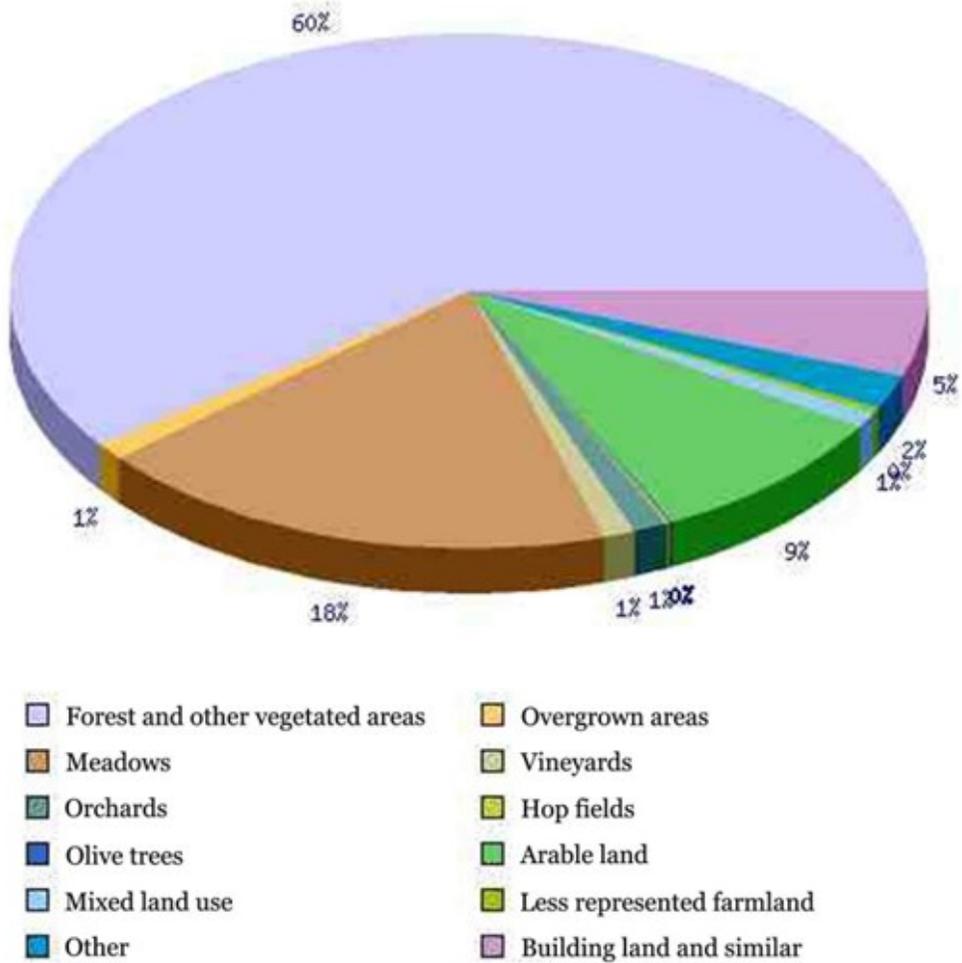


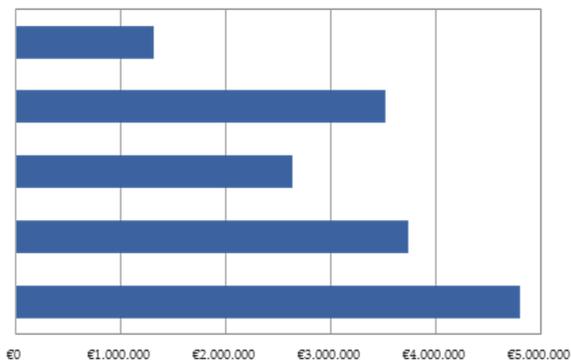
Fig. 1 Land use in Slovenia. Most preventive archaeology is implemented on building and similar land, which represents ca. 5% of the country, only occasionally on other types of land.

Year	Number of private companies	Budget of archaeological projects	No of employed archaeologists
2004	8	1.309.206 €	13
2008	22	3.515.261 €	35
2012	21	2.634.226 €	49
2015	22	3.727.907 €	63
2021	25	est >4.800.000 €	>90

Fig. 2 Economy of private sector in preventive archaeology.



### Budget of preventive archaeology – private sector



Figs. 3 - 5 Additional data on the economy of private sector in preventive archaeology.

## Effects of the 2008 Law on Protection of Cultural Heritage and 2013 Regulations on Archaeological Research

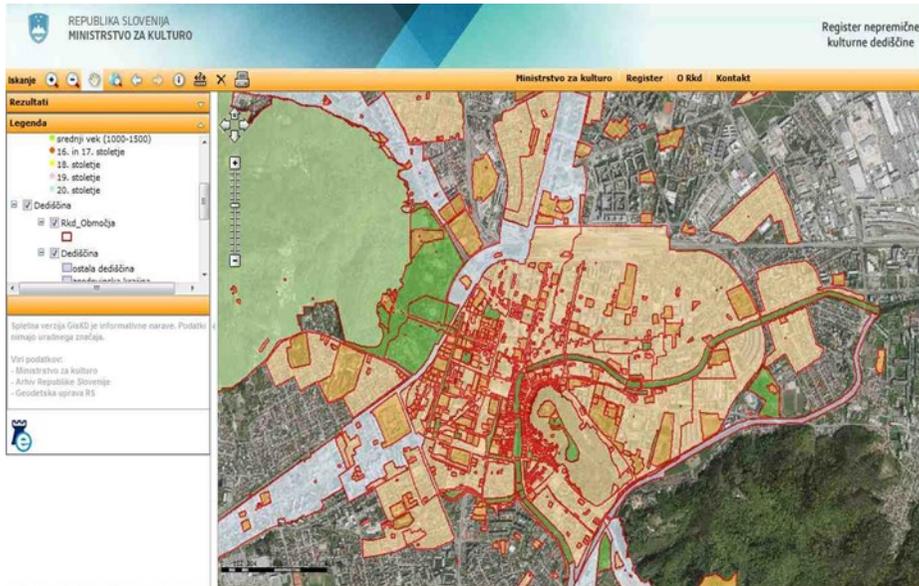


Fig. 6 National register of protected archaeological heritage. Web-GIS frontend.

- A) All reports must be submitted timely; otherwise, sanctions (temporarily blocked applications for new permits).
- B) Reports must include exact data on spatial position, finds, stratigraphy, samples, etc.
- C) Site archives must be fully processed before handing over to museums.
- D) Increased specialization and profile of archaeological teams.
- E) Integration with the academic sector (reviewing of reports)
- F) All archaeological projects (preventive projects included) are considered research projects.
- G) Permits for archaeological projects can only be issued without proof of coverage costs for 'post-field' works.
- H) Emergence of consortia for large-scale projects; combined private-public consortia.

# Overview of entrepreneurship in Croatian Archaeology

Josip Burmaz

## Legal framework

*European Convention on Protection of Archaeological Heritage (La Valletta, 1992)*

*Law on the Protection and Safeguarding of Cultural Heritage*

*Regulation on Archaeological Research*

*Permit for archaeological research*

*Regulation on storing movable archaeological objects*

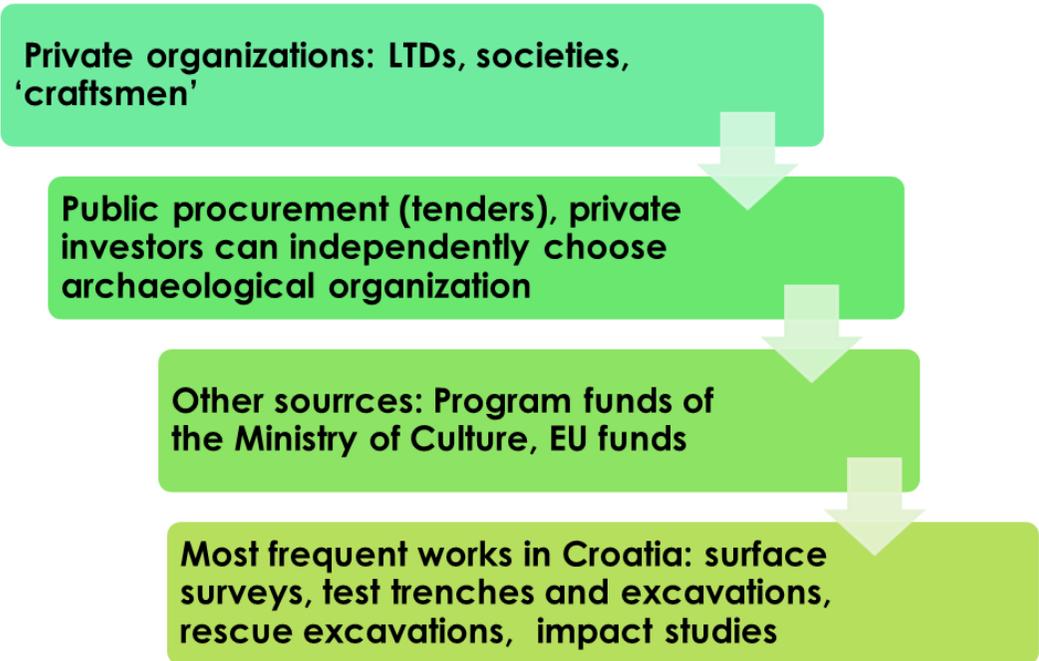
## Regulations on Archaeological Research

- Define archaeological research: research excavations, rescue excavations, revision excavations, test excavations, archaeological monitoring, archaeological surveys, reambulation, and non-destructive methods (geophysics, aerial archaeology).
- Documentation of archaeological research comprises maps of sites with absolute coordinates of discovered structures (plans, sections), lists of stratigraphic units, movable finds, samples, photographs of sites, their parts and finds, and fieldwork logs.
- Valorization of sites is considered the interpretation of discovered structures (phases, age, assumed function).

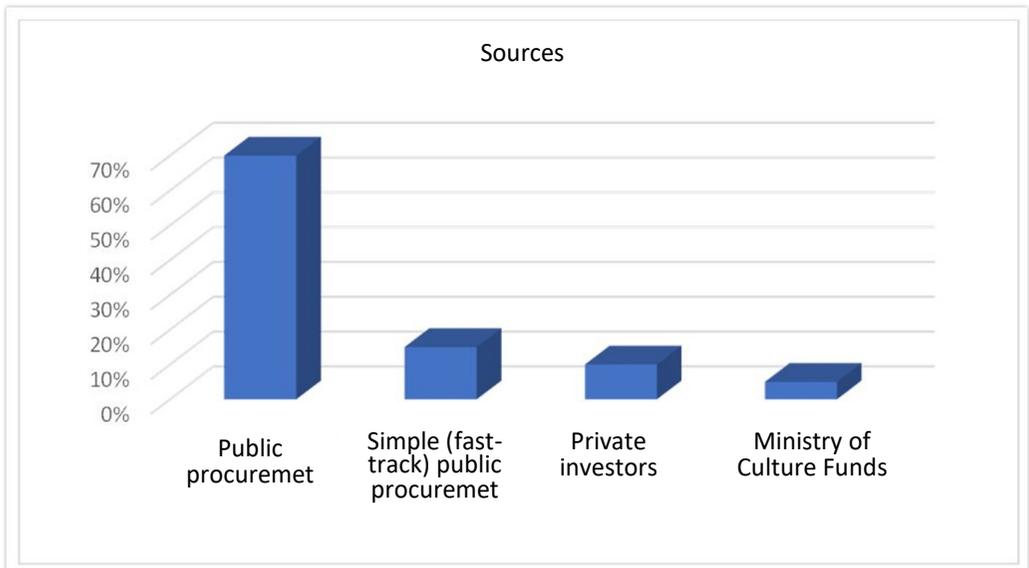
## Permit for Archaeological research (basic elements)

- Data on locality (name, chronology, geographic coordinates, cadastral unit, municipality, region)
- Type of research, period, data on applicant
- Proof of financial coverage (contracts, breakdown of costs)
- Proof of the temporary storage of finds and records

## The world of entrepreneurial sector in Croatian archaeology



## Sources of income of Kaducej d.o.o.



## Public procurement

Various governmental and state-owned organizations are among the principal investors in large-infrastructure works which frequently demand preventive archaeological research (e.g. motorways, gas lines, electricity infrastructure, etc.).

# Public procurement

Procurement of works, goods and services by governmental, state-owned organizations

Electronic procedure

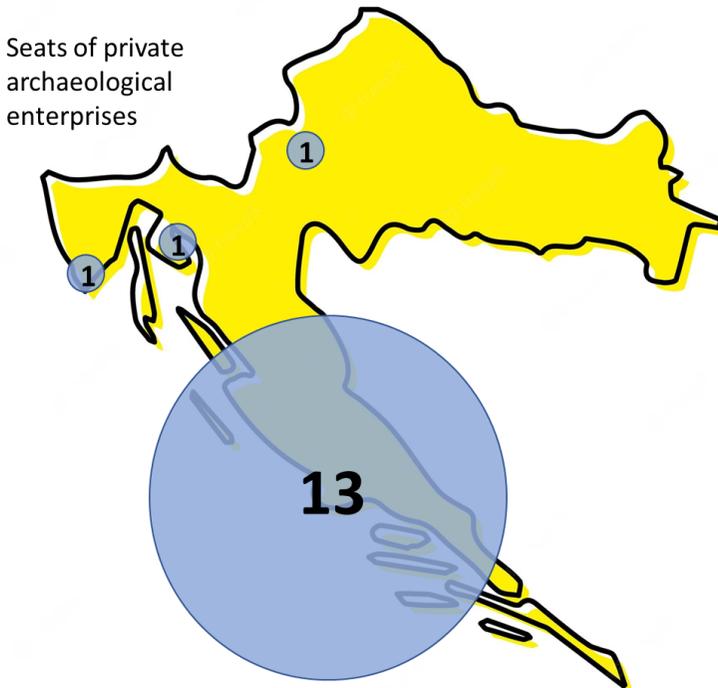
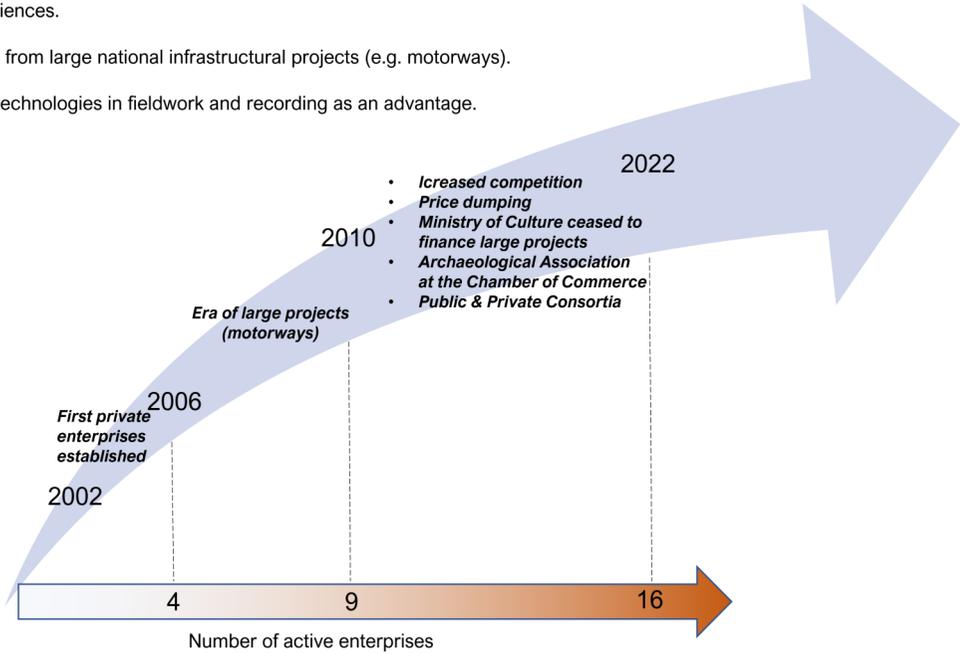
Defined exact criteria for procurement product

Exclusion criteria: good standing in tax obligations (firm) and non sentenced for criminal (firm's CEOs)

Criteria for selection: price (90%) and technical references (10%)

## Milestones in development of entrepreneurialship in Croatian archaeology

- Initiatives for private enterprises in archaeology modelled after Slovenian experiences.
- Boost from large national infrastructural projects (e.g. motorways).
- New technologies in fieldwork and recording as an advantage.



**Other opportunities for archaeological enterprises**



# Legal conditions for entrepreneurship in Serbian archaeology

Nenad Jončić

## Law on cultural goods:

(ARTICLE 17) - Archaeological excavations and research can be performed by the authorised institutions for the protection of cultural heritage in accordance with this law.

(ARTICLE 112) - Excavations and research of archaeological sites perform a research institution or institution authorized for the protection of cultural heritage in accordance with this law.

## Employment in archaeology

- A) Annually, some 60 students are enrolled in archaeology.
- B) More than 300 archaeologists graduated in the last 10 years.
- C) Between 220 and 230 archaeologists are employed in Serbia
  - 43 museums (ca. 70 archaeologists)
  - Institute for the Protection of Cultural Monuments (13 units, ca. 20 archaeologists)
  - Research institutes (ca. 50 archaeologists)
  - Universities (ca. 40 archaeologists)

(Source: Црнобрња, А. 2017. Археолошко наслеђе у Србији данас – брига државе или посао ентузијаста. Модерна конзервација 5: 77-96.

## Entrepreneurship in Serbian archaeology

Three possible bussines organizations:

Stručnjak u  
kulturi

(Individual) Expert in culture

Samostalni  
preduzetnik

(Individual) Independent entrepreneur

DOO - društvo  
sa ograničenom  
odgovornošću

Limited company or society (Ltd)

Since non-public organizations can not excavate or research archaeological sites, what other jobs are allowed to private archaeological entrepreneurs:

Recording (general, in the field)
Work on archaeological objects (all kinds of post-field processing)
Drawing
Conservation (restoration)
Photographing, Aerial photography
CAD support
GIS support
3D modelling, 3D reconstructions
Designing and maintaining web sites, social media
Production of VR and similar content

# Overview of entrepreneurship in Slovak archaeology

Milan Horňák

## Organization of system of heritage protection in Slovakia

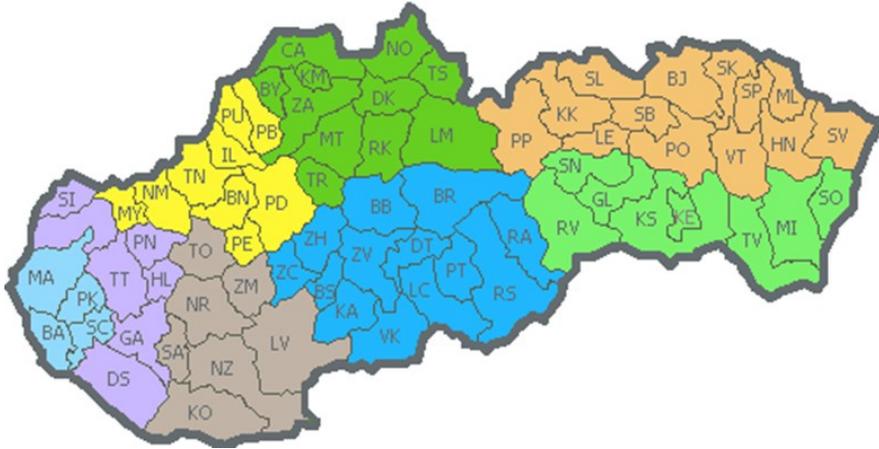


Fig. 1 Administrative division of Slovakia.

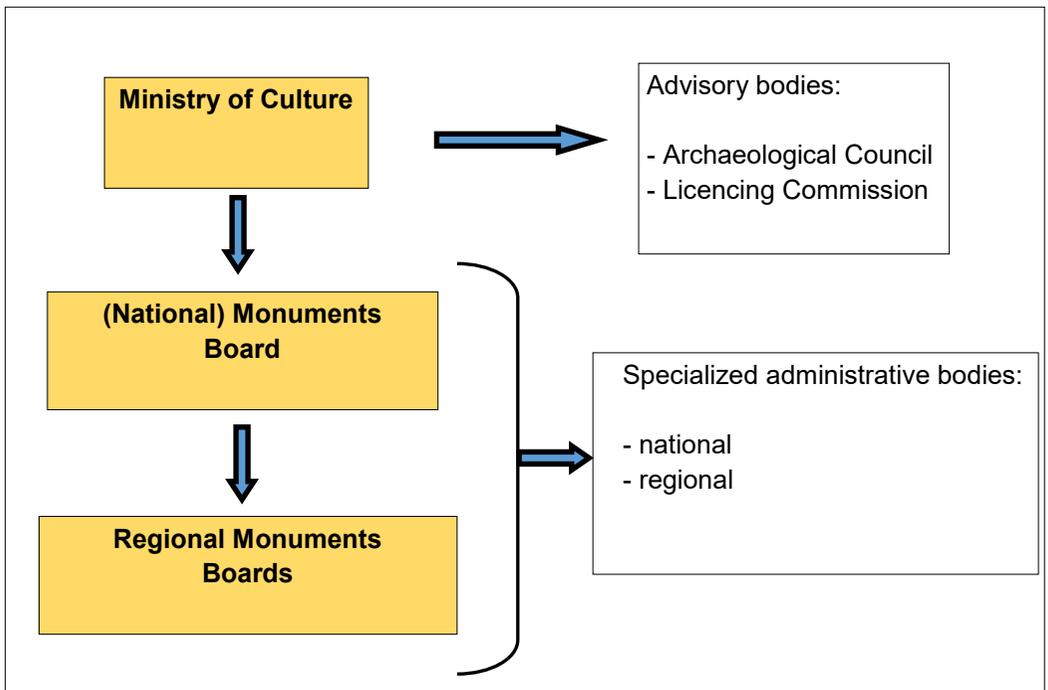


Fig. 2 National and regional authorities in heritage protection.

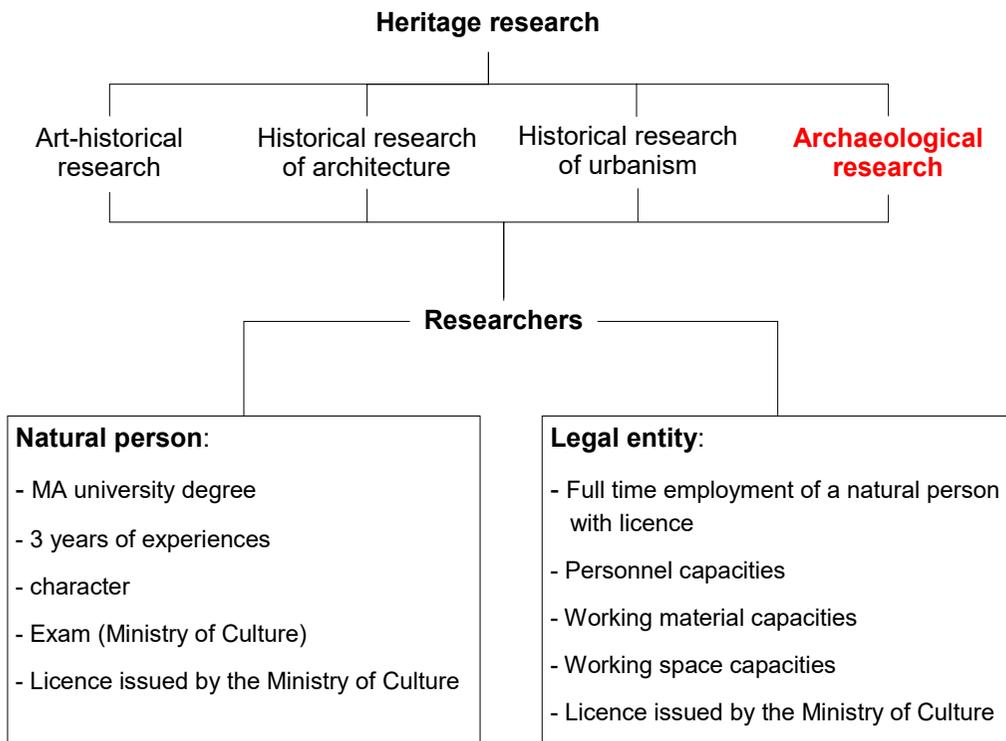


Fig. 3 Organization of heritage research and requirements for researching entities.



Fig. 4 Subjects in archaeological research.

**Preventive archaeology in practise (works)**



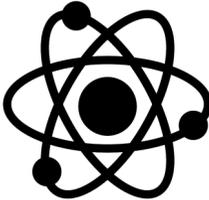
Field research



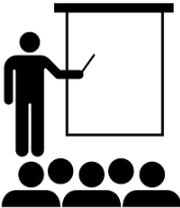
Recording



Surveying



Scientific analyses



Presentation



Conservation



Storing



Processing of finds & data

## Pricing (test trenches)



A) The price unit for non-urban areas is defined for 10 x 100 m of trench excavation. The model trench is 1 m wide and up to 1,5 m deep.

Unit price for 10 x 100 m	=	478,14 € (VAT included)
Material	=	43,38 € (VAT included)
Wages	=	434,76 € (VAT included)

B) The price unit for urban areas is defined for 10 x 50 m of trench excavation. The model trench is 1 m wide and up to 1 m deep.

Unit price for 10 x 100 m	=	478,14 € (VAT included)
Material	=	43,38 € (VAT included)
Wages	=	434,76 € (VAT included)

C) Research documentation. The price for processing research documentation is calculated as a % of the total price (without VAT) of the field work:

- ca. 25% for non-urban areas
- ca. 30% for urban areas

## Pricing (excavations)



The price unit is calculated as person/hour according to the professional profiles.

- A) Qualified employee (archaeologist with exam) = 24 € (VAT included)
- B) Qualified employee (archaeologist without exam) = 19,203 € (VAT included)
- C) Qualified employee (1<sup>st</sup> class technician) = 16,8 € (VAT included)
- D) Qualified employee (2<sup>nd</sup> class technician) = 11, 24 € (VAT included)
- E) Unqualified worker (digger, washer, etc.) = 8.4 € (VAT included)

The price for processing research documentation is calculated according to different types of sites:

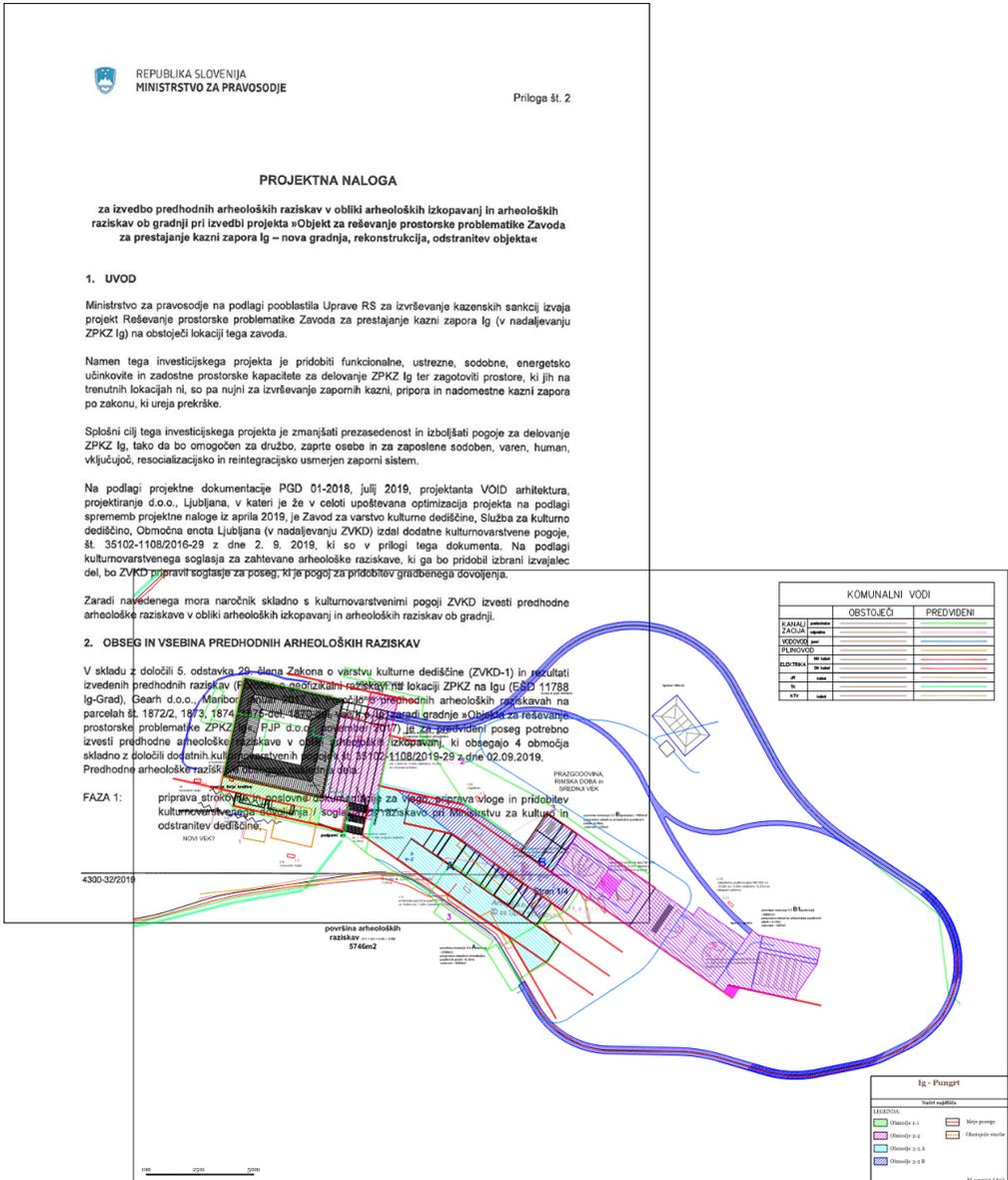
- Burial site = ca. 50 % of fieldwork costs (without VAT)
- Site with complex stratigraphy = ca. 30% of fieldwork costs (without VAT)
- Site with simple stratigraphy = ca. 25% of fieldwork costs (without VAT)

# Management of large-scale projects

Matjaž Novšak, Petra Vojaković

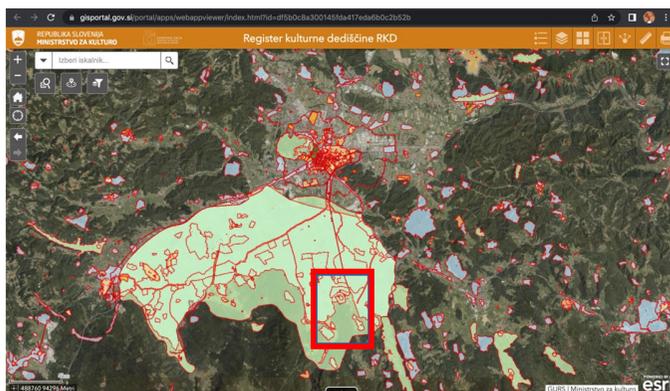
## The case of the the prehistoric hillfort site of Pungart above Ig

**REASON:** Ministry of Justice planned new women's correction facility on the location of Pungart.



**PROTECTION:** The site is registered in the Cultural Heritage Registry as 11151 (Ig—Archaeological site Pungart), 11788 (Ig—Castle), and 11819 (Cultural landscape Ljubljansko barje).

Institute for the Protection of Cultural Heritage of Slovenia (Ljubljana Unit) issued protection conditions and measures (2.9.2019). These measures were issued based on the results of the test trenches and drilling research in 2017 and 2018.



*Fig. 2 Protected areas (Cultural Heritage Registry).*



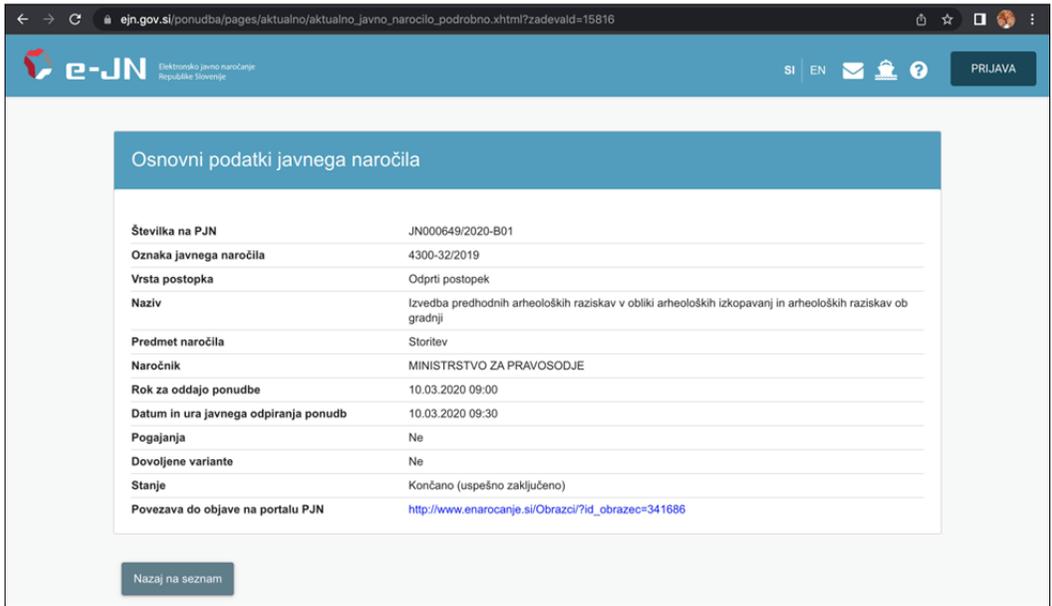
*Fig. 3 Test excavations and drilling. (2017 and 2018).*

**Protection conditions issued by the Institute of the Cultural Heritage Protection included:**

- A) Area 1, south of the castle (588 m<sup>2</sup>), can be excavated with machines max to a 0,4 m depth. Archaeological layers with an average depth of 0,4 m can be excavated by combining machine and manual excavation down to the geological base.
- B) Area 2, the existing parking area (1276 m<sup>2</sup>), can be excavated with machines down to 1,2 m depth. Archaeological layers with strong archaeological potential (0,1 m deep) must be excavated manually.
- C) Area 3A, Pungart (2299 m<sup>2</sup>), can be excavated with machines (1 m deep). Archaeological layers and structures from prehistoric, Roman and medieval periods (average depth of 0,7 m) found at a depth between 0,8 and 1,48 m must be excavated manually. Sampling for archaeobotanical and pollen analyses is required. It is expected that 3% of all pits will be dug into the geological base at 2,5 m.
- D) Area 3B (1538 m<sup>2</sup>) can be excavated by combining machine and manual methods down to the depth of 0,15 m. Archaeological layers and structures (0,10 m thick) have to be excavated manually. Sampling for archaeobotanical and pollen analyses is required. It is expected that 3% of all pits will be dug into the geological bases at a depth of 0,4—0,6 m.
- E) Archaeological layers and deposits have to be recorded according to the Regulation for Archaeological Research. For the processing of finds and documentation, 30% of the fieldwork costs are planned.

## Competing for the project

Since the investor was a public entity (Ministry of Justice), the competition had to follow the Law on public procurement. The deciding factors were price, expert references of team members and business references of the company.



The screenshot shows the 'e-JN' (Elektronsko javno naročanje) website interface. The main content area is titled 'Osnovni podatki javnega naročila' (Basic data of the public procurement). It contains a table with the following information:

Številka na PJN	JN000649/2020-B01
Oznaka javnega naročila	4300-32/2019
Vrsta postopka	Odperti postopek
Naziv	Izvedba predhodnih arheoloških raziskav v obliki arheoloških izkopavanj in arheoloških raziskav ob gradnji
Predmet naročila	Storitev
Naročnik	MINISTRSTVO ZA PRAVOSODJE
Rok za oddajo ponudbe	10.03.2020 09:00
Datum in ura javnega odpiranja ponudb	10.03.2020 09:30
Pogajanja	Ne
Dovoljene variante	Ne
Stanje	Končano (uspešno zaključeno)
Povezava do objave na portalu PJN	<a href="http://www.enarocanje.si/Obrazci/?id_obrazec=341686">http://www.enarocanje.si/Obrazci/?id_obrazec=341686</a>

At the bottom left of the table area, there is a button labeled 'Nazaj na seznam' (Back to list).



The document is an official tender and accompanying documentation from the Ministry of Justice of the Republic of Slovenia. It includes the following text:

REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA PRAVOSODJE

Številka: 4300-32/2019/11  
Datum: 30. 1. 2020

**DOKUMENTACIJA V ZVEZI Z ODDAJO JAVNEGA NAROČILA**

**IZVEDBA PREDHODNIH ARHEOLOŠKIH RAZISKAV V OBLIKI ARHEOLOŠKIH IZKOPAVANJ IN ARHEOLOŠKIH RAZISKAV OB GRADNJI PRI IZVEDBI PROJEKTA »OBJEKT ZA REŠEVANJE PROSTORSKE PROBLEMATIKE ZAVODA ZA PRESTAJANJE KAZNI ZAPORA IG – NOVA GRADNJA, REKONSTRUKCIJA, ODSTRANITEV OBJEKTA«**

(naročnikova oznaka naročila: 4300-32/2019)

Fig. 4 Official tender and accompanying documentation.

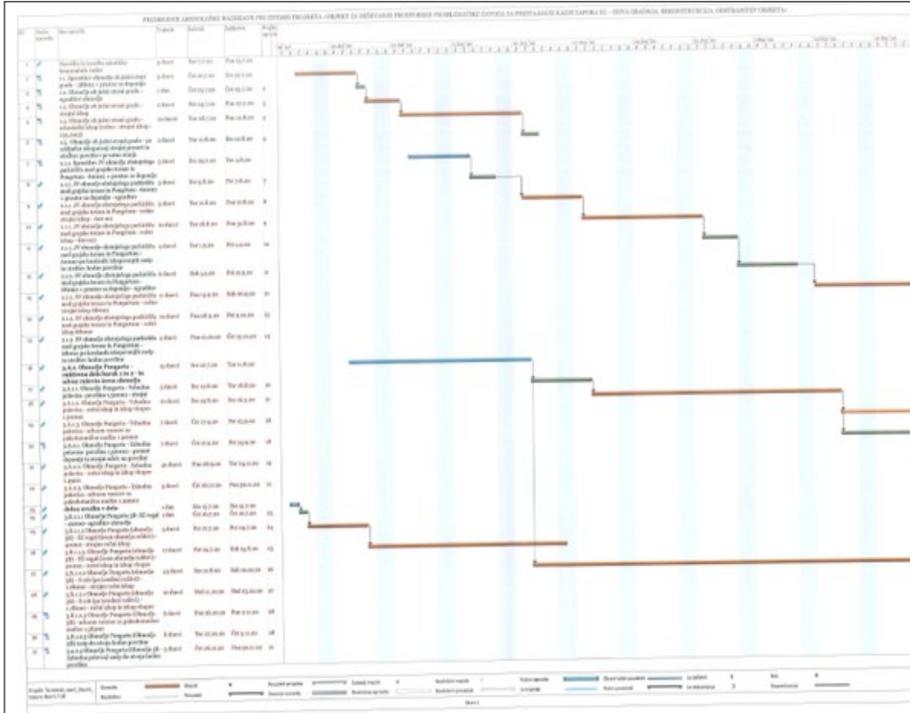
After winning the tender, the procedure for obtaining the permit from the Ministry of Culture was followed. According to the Law, such a permit must be issued by the Minister following the opinion of the Commission for Archaeological Research. Application to the Commission requires exact data on the project (size, area, dates, team structure, proofs of cost covering, the reason for the research, team leader(s) with adequate professional references, etc.). The permit also nominates the monitoring expert from the Institute of the Protection of Cultural Heritage. And institution of final storage and archiving (authorised museum).

	<b>REPUBLIKA SLOVENIJA</b> <b>MINISTRSTVO ZA KULTURO</b>	
Maistrova ulica 10, 1000 Ljubljana		T: 01 369 59 00 F: 01 369 59 01 E: gp.mk@gov.si www.mk.gov.si
Številka:	62240-269/2020/6	
Datum:	24. 6. 2020	
<p>Minister, pristojen za kulturo, na podlagi prvega in tretjega odstavka 31. člena Zakona o varstvu kulturne dediščine (Uradni list RS, št. 16/08, 123/08, 8/11 - ORZVKD39, 90/12, 111/13, 32/16 in 21/18 - ZNORG; v nadaljevanju: ZVKD-1), Pravilnika o arheoloških raziskavah (Uradni list RS, št. 3/13; v nadaljevanju: Pravilnik) in na podlagi vloge vlagatelja Arhej d.o.o., Drožanjska 23, 8290 Sevnica, z dne 19. 6. 2020, dopolnjene dne 24. 6. 2020, v upravni zadevi dovolitve arheološke raziskave izdaja</p>		
<hr/> <p><b>kulturnovarstveno soglasje za raziskavo in odstranitev arheološke ostaline</b></p>		
<p>1. Izvajalcu Arheološkemu konzorciju Ig, ki ga sestavljajo pravne osebe Arhej d.o.o., Drožanjska 23, 8290 Sevnica, PJP d.o.o., Trg Alfonza Šarha 1, 2310 Slovenska Bistrica, ZRC SAZU, Novi trg 2, 1000 Ljubljana in Skupina Stik, Cesta Andreja Bitenca 68, 1000 Ljubljana (odgovorni izvajalec: Arhej d.o.o., Drožanjska 23, 8290 Sevnica; v nadaljevanju: izvajalec), se za naročnika Ministrstvo za pravosodje, Župančičeva 3, 1000 Ljubljana (v nadaljevanju: naročnik), dovolita raziskava in odstranitev arheološke ostaline – arheološke raziskave ob gradnji in arheološko izkopavanje na lgu (EŠD 11151, Ig - Arheološko najdišče Pungrt; EŠD 11788, Ig - Grad; EŠD 11406, Ig - Rimskodobna vaška naselbina; EŠD 11819, Ljubljana - Kulturna krajina Ljubljansko barje), zaradi novogradnje zopora na zemljiščih s parc. št. 1872/2, 1873, 1874, 1875, 1870, vse k. o. 1700 - IG; lastnik zemljišča: Republika Slovenija, Gregorčičeva 20, 1000 Ljubljana (pisno soglasje upravnik zemljišča št. 478-4/2010/47 z dne 18. 6. 2020, izdajatelj: Ministrstvo za pravosodje, Urad RS za izvrševanje kazenskih sankcij, Beethonova ulica 3, 1000 Ljubljana, podpis odgovorne osebe: Slavica Skobir, vodja Sektorja za splošne pravne in ekonomske zadeve).</p>		
<p>2. Arheološko raziskavo vodita dr. Petra Vojaković, univ. dipl. arheol. in Jerica Brečič univ. dipl. arheol., s strokovno ekipo; namestniki vodji raziskave so Robert Erjavec, univ. dipl. arheol., mag. Matjaž Novšak, univ. dipl. arheol., dr. Tina Žerjal, univ. dipl. arheol. in dr. Tamara Leskovar, univ. dipl. arheol. Geološke raziskave bo izvajal dr. Tomaž Verbič, univ. dipl. inž. geol.</p>		
<p>3. Arheološka raziskava, ki se ji dodeli koda 20-0266, se izvede v skladu z določbami kulturnovarstvenih pogojev št. 35102-1108/2016-29 z dne 2. 9. 2019, ki jih je izdal Zavod za varstvo kulturne dediščine Slovenije, Območna enota Ljubljana.</p>		
<p>4. Arheološka raziskava se izvede predvidoma v terminu med 24. 6. 2020 in 24. 6. 2021.</p>		
<p>5. Stroške raziskave krije naročnik.</p>		
<p>6. Strokovni nadzor nad arheološko raziskavo bo izvedel Zavod za varstvo kulturne dediščine Slovenije, Območna enota Ljubljana, Tržaška cesta 4, 1000 Ljubljana (v nadaljevanju: ZVKDS OE Ljubljana). Za nadzornici arheološke raziskave se določita višja konservatorka Mija Topličanec, univ. dipl. arheol. in konservatorska svetovalka dr. Maja Bricelj, univ. dipl. arheol. Za</p>		

Fig. 5 The permit issued for the Pungart project..

# Workplan

1. INTRODUCTION (Contractors, contract object (works defined, area, size, reasons for work, dates...).
2. WORK METHODOLOGY (types of excavation and other works, team structure)
3. WORKFLOW, SCHEDULE, RESPONSIBILITIES



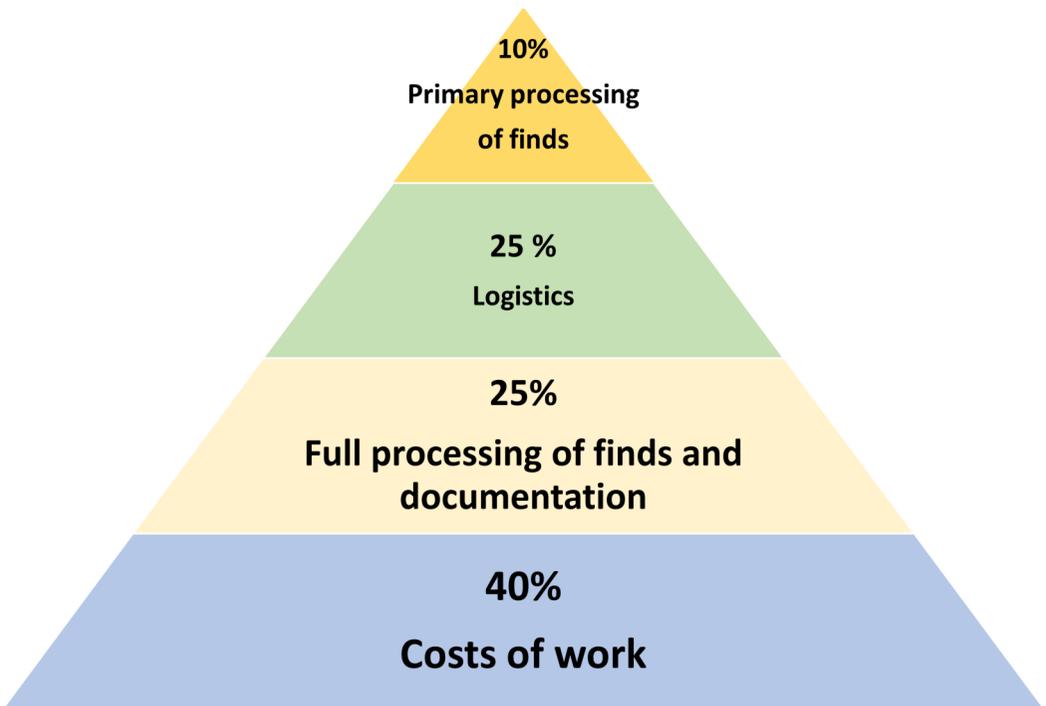
4. EQUIPMENT (tools, materials, machines...) and INFRASTRUCTURE (site organization: electricity, water, sanitary services, working venues...)
5. HEALTH AND SAFETY PLAN



Fig. 6 Health and safety Plan

## Financing

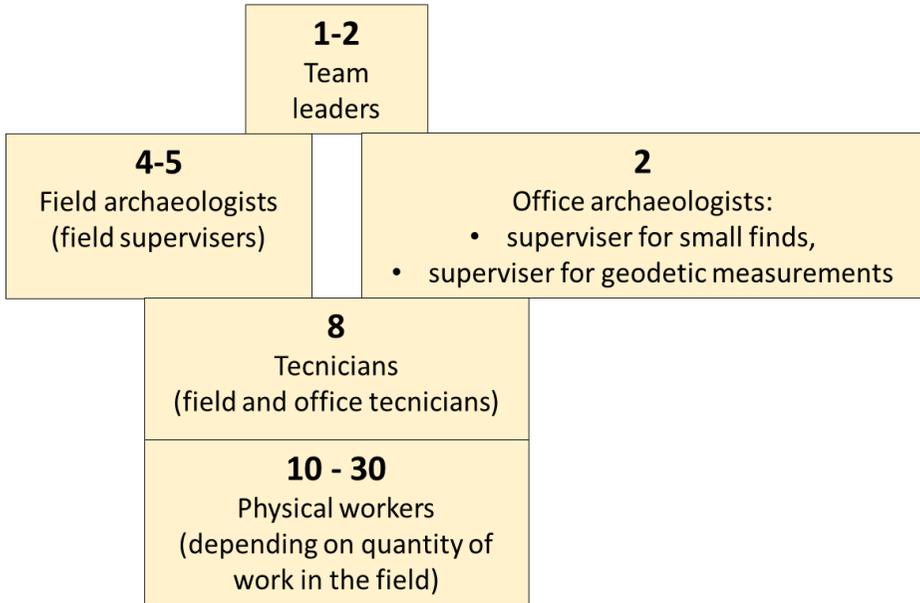
Large-scale projects are also a big financial challenge. Despite careful and detailed planning, the situation in the field can change substantially. Many factors can cause substantial changes: weather, the estimated depth of archaeological deposits may prove different, overestimated or underestimated quantity of finds and structures, ‘accidental’ discovery of unexpected site type or period (e.g. burial site), changes of the team (the projects was done during the COVID epidemics), etc. In addition, during the project at Pungart, several parts of mortar bomb shells were found, which required the interventions of the special demining team. All the above reasons may have consequences for the financial management of the project. Please remember that the foundations of a quality excavation are well-arranged logistics.



*Fig. 7 Estimated ration of costs.*

# Logistics and organization of the Pungart project

## Team



## Obligatory and necessary documentation

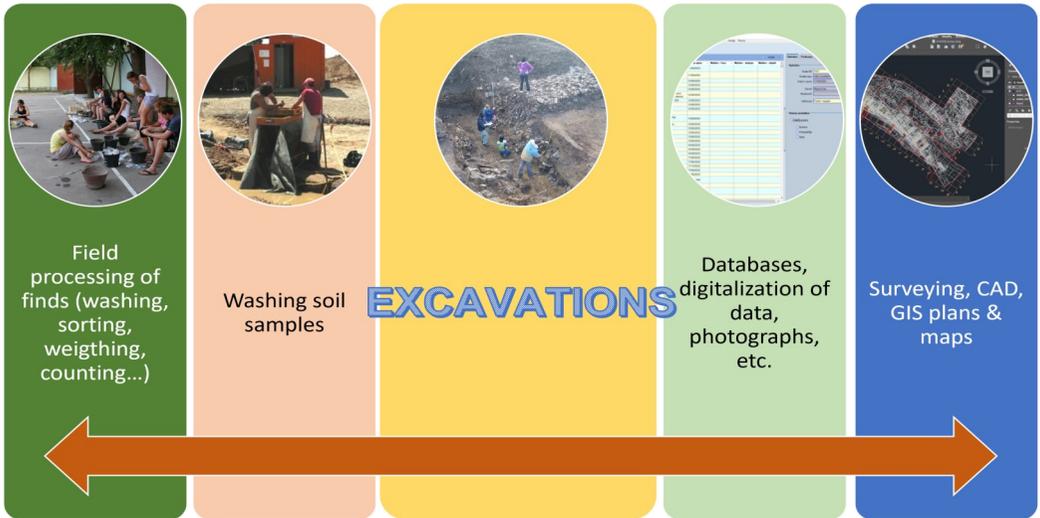
Archaeological forms and lists

Obligatory Log for construction works

Health and Safety Plan

Other business and organizational lists (permits, working contracts, financial documents, etc.)

## Works parallel with excavation



## Unpredictable circumstances

**epidemics**

**area with WW2 shells**

**Work in highly secured area (prison)**

**Kaj morai storiti, ob najdbi NUS?**

**Takoj pokliči številko 112 in povej:**

- kje si bil/a,
- kaj si našel,
- kakšen je predmet,
- ali so opreženi ljudje na kraju.

**aj! kaj! kaj! vljaj! genj!**

## Media and public

Archaeology, in general, and preventive archaeology, in particular, need promotion in the media and public. In this way, archaeology's relevance and heritage are demonstrated for their contribution to societal and cultural values.



Fig. 8 A ground plan reconstruction of the multi-period site Pungrt. Drawing: Petra Vojaković, Arhej d.o.o .



## Project's follow-up

Due to extraordinary findings, the Pungart site, one of the earliest proto-urban settlements in Slovenia (Iron Age), the Department of Archaeology successfully applied for the research project at the National Research Agency. The project includes various remote-sensing method, micro-geomorphological research of the settlement object, bioarchaeological research of plant and animal remains and advanced analyses of pottery.

Univerza v Ljubljani  
Filozofska fakulteta

SPREMENI KONTRAST    OBVESTILA    VIS    URNIK    E-UČENJE    ŠSFF    INTRANET    POŠTA    ZAPOSLENI    INT.OFFICE    ODELKI

FAKULTETA    ŠTUDIJ    RAZISKOVANJE    IZOBRAŽEVANJA    KNJIŽNICA    PUBLIKACIJE

ODDELEK ZA ARHEOLOGIJU

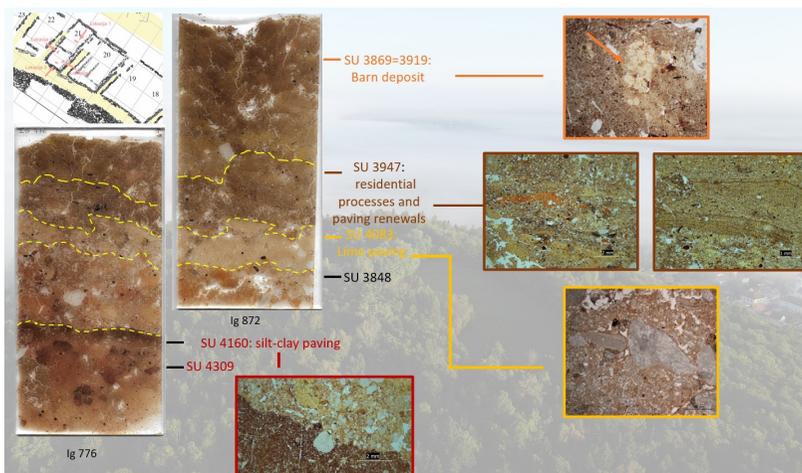
# Projekt Protourbano gradišče Pungrt nad Igom: od 10 hektarjev k 10 mikronom

Filozofska fakulteta / Projekt Protourbano gradišče Pungrt nad Igom: od 10 hektarjev k 10 mikronom

- Fakulteta
- Študij
- Raziskovanje
- Izobraževanja
- Knjižnica
- Publikacije

## O PROJEKTU

Projekt *Protourbano gradišče Pungrt nad Igom: od 10 hektarjev k 10 mikronom* predstavlja interdisciplinarno raziskavo življenja na gradišču v času od starejše železne dobe do rimskega obdobja. Gre za prvo poglobljeno študijo fizične, gospodarske in družbene ureditve prostora v notranjosti katerega izmed gradišč na Slovenskem. V raziskavi, ki jo financira Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS) sodelujeta dve članici Univerze v Ljubljani – Filozofska fakulteta, Oddelek za arheologijo in Center za interdisciplinarne raziskave v arheologiji ter Biotehniška fakulteta, Oddelek za agronomijo in Infrastrukturni center za pedologijo in varstvo okolja – s svojimi raziskovalnimi centri in gospodarska družba – Arhej d.o.o., Inštitut za geoarheologijo – z lastno raziskovalno-razvojno skupino.



# After field work: enterprise of specialists

Tina Žerjal, Petra Vojaković, Iris Bekljanov Zidanšek

With the current development of archaeology and a considerable increase in the number of preventive projects, the amount of work also increased after the excavations or other fieldwork campaigns. The increase is especially visible in the number of finds, samples, and records created during and after the fieldwork.

Such an increase and modern standards of archaeological works demand more experts, knowledge and equipment, and ultimately the re-organization of works as we have practised in the past. In addition, post-excavation works (processing of finds and records, efficient storing and archiving, presentation of results and similar) provide great potential for the employment of archaeologists and other experts., and for entrepreneurial types of engagement.

The paper presents various steps in post-excavation works practised in the Arhej enterprise.

However, before presenting our practice in Slovenia, we must note some legislative and obligatory requirements concerning processing archaeological finds and records.

The Slovene Law on the Protection of Cultural Heritage:

*Preliminary research is the research of heritage or archaeological remains that needs to be carried out to obtain the information necessary for the evaluation of heritage or archaeological remains before the start of physical interventions in the area or before construction to more precisely determine the protection measures, to more precisely determine the archaeological heritage or archaeological remains before physical interventions in the space, i.e. before construction, or to move the archaeological heritage in a controlled manner before construction. **Preliminary archaeological research also includes processing the archives of the archaeological site after excavation.***

The Regulations on Archaeological Research:

The first report must be submitted within 60 days after the completion of fieldwork, and it must be accessible to the public. It should contain:

- General results of the field research with preliminary interpretation
- Basic plans and photographs
- List of all field documentation (list of stratigraphic units, samples, special finds, photos, etc.)
- Record of the Commission for post-excavation works stating required works and types, quantity and details for computer processed geodetic data, visual documentation, conservation of finds, planned scientific analyses, an estimate of the lengths of the final report, the proposal for reviewers.

PRILOGA 6

ZAPISNIK KOMISIJE ZA POTERENSKO OBDELAVO ARHIVA ARHEOLOŠKEGA NAJDIŠČA

Številka:  
Datum:  
Lokacija:

PRISOTNI  
Člani komisije:  
Odgovorni arheolog-konzervator:  
Vodja raziskave:  
Zunanji strokovnjak:

Drugi  
Odgovorna oseba izvajalca:

1. Osnovni podatki o najdišču in raziskavi po kulturnovarstvenem soglasju

- Ime
- Nasejje
- Številka soglasja za raziskavo
- Izvajalec
- Vodja raziskave
- Vrsta raziskave (iz soglasja za raziskavo)
- Datum začetka in konca terenskih del
- Mestočasne hrambe arhiva arheološkega najdišča

2. Zahtevnost raziskave in kompleksnost arhiva najdišča glede na:

- trajanje terenskih del,
- število kontekstov (stratigrafskih, strukturnih oz. zbiralnih ali drugih opazovanih enot),
- količino zbirk najdb in vzorcev,
- ocenjeno količino premičnih najdb z zahtevnim varovalnim režimom oz. potrebnih čimprejšeje konzervacije in
- ocenjeno količino potrebnih specialističnih analiz za pripravo končnega poročila.

Ocenjena stopnja zahtevnosti: osnovna, srednja, visoka

3. Ocena obsega del poterenske obdelave za pripravo končnega strokovnega poročila

I. Računalniška obdelava dokumentacije prostorskih izmer, vizualno-grafične in pisne dokumentacije

Delo/postopek	Količina/čas	Opombe
obdelava dokumentacije prostorskih izmer		
izdelava vektorskih načrtov		
vektorizacija (načrti, fotografije, fotokopije ...)		
skeniranje (načrti, fotografije, fotokopije ...)		
skeniranje pisne dokumentacije (obrazci, terenski dnevniki ...)		
drugo (navesti in utemeljiti)		

kemična analiza gline		
analiza malte		
geokemična/mineralološka analiza		
<i>datiranje</i>		
radiokarbonska analiza – 14C		
dendrokronološka analiza		
termoluminiscenčna analiza – TL		
drugo		
analiza kamnitega orodja		
analiza sledov uporabe		
določitev tehnoloških skupin keramike		
numizmatična analiza		
druge analize (navesti in utemeljiti)		

V. Poročilo

Delo/postopek	Količina/čas	Opombe
interpretacija (izdelava strokovne študije)		
izdelava kataloga		
recenzija		

II. Vizualno-grafično dokumentiranje najdb

Delo/postopek	Količina/čas	Opombe
risanje najdb		
vektoriziranje risb najdb		
fotografiranje najdb in obdelava posnetkov		
drugo (navesti in utemeljiti)		

III. Konservacija/restavriranje najdb

Delo/postopek	Količina/čas	Opombe
<i>kovina</i>		
železo – zahtevno		
železo – manj zahtevno		
bron – zahtevno		
bron – manj zahtevno		
svinec/srebro/ ...		
<i>keramika</i>		
keramika – zahtevno		
keramika – manj zahtevno		
steklo		
kamen		
<i>organski materiali</i>		
jantar		
kost/roževina		
les – zahtevno		
les – manj zahtevno		
usnje		
tkanina		
drugo (navesti in utemeljiti)		

IV. Analize

Delo/postopek	Količina/čas	Opombe
<i>osteologija</i>		
antropološka analiza – žgane/fragm. kosti		
antropološka analiza – cele kosti		
arheozoološka analiza		
<i>paleobotanika</i>		
arheobotanična analiza		
palinološka analiza		
analiza fitolitov		
analiza lesnih ostankov in oglja		
<i>geologija</i>		
sedimentološka analiza		
petrografska analiza		

*Record of the Commission for post-excavation works. The Commission comprises three members (a lead excavator, a monitoring expert from the Institute for the Protection of Cultural Heritage) and an external expert.*

## Estimate of required work for final report:

- I - Computer processing of geodetic documentation, visual documentation and textual documentation
- II - Visual and Graphic documentation of finds
- III - Conservation/Restoration of finds
- IV - Scientific analyses
- V - Work for finalizing the final report (interpretation study, catalogue, review)

The post-processing work starts already in the field.



*Washing of small finds.*



*Sorting, counting and weighing by material (ceramics, glass, stone, bone, coin, bronze, iron, animal bones, etc.) and time period (prehistory, roman era, middle ages, etc.).*

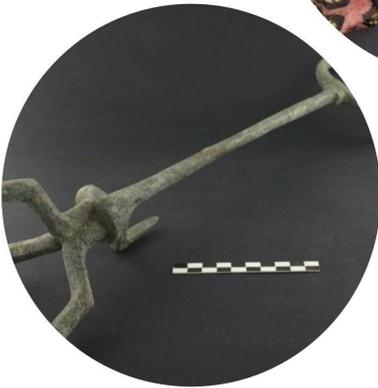


*Identifying artefacts for further analysis, conservation, drawing and final catalogue.*



*Washing soil samples.*

An example of the large-scale excavations: Celje- Mariborska cesta (Roman urban site).

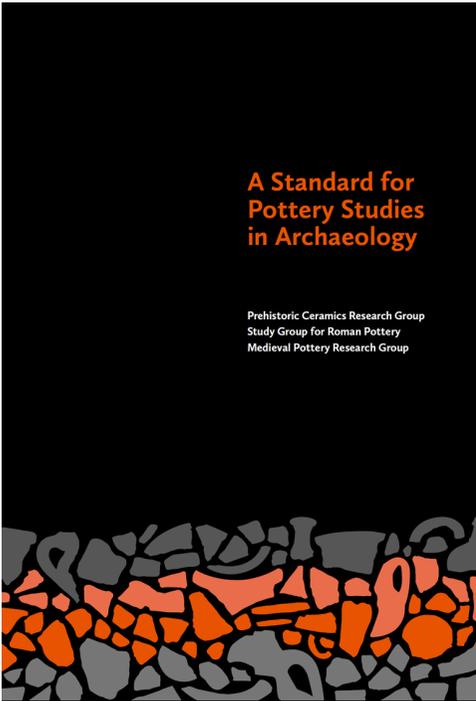


**Metal objects** ca. 4.000 pieces

**Pottery** 339.088 sherds (5,7 tons)

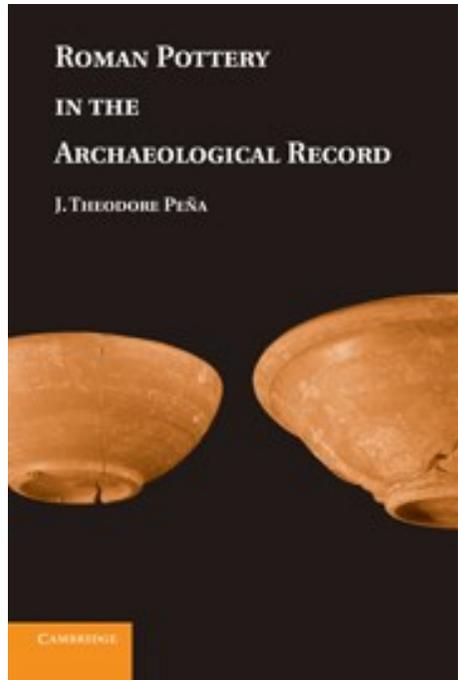
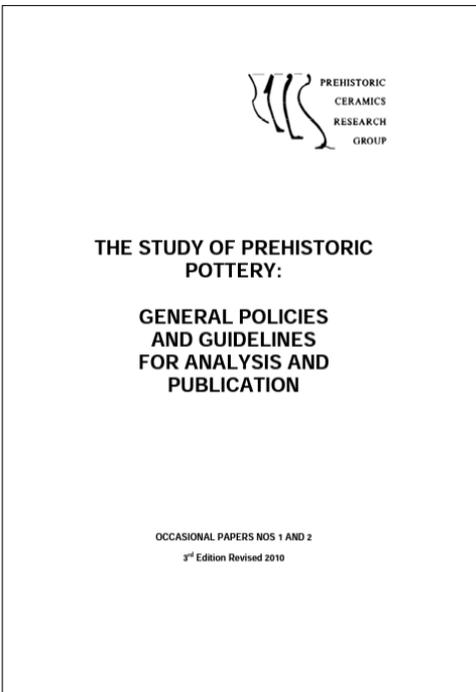
**Bricks** over 70.000 pieces (over 8 tons)

# Reference publications, guidelines, manuals...



## Contents

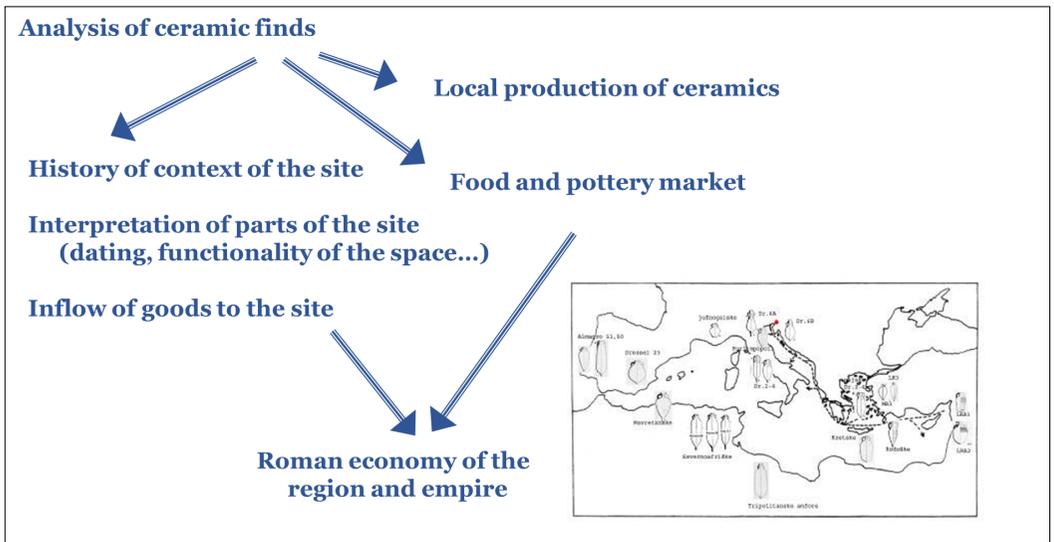
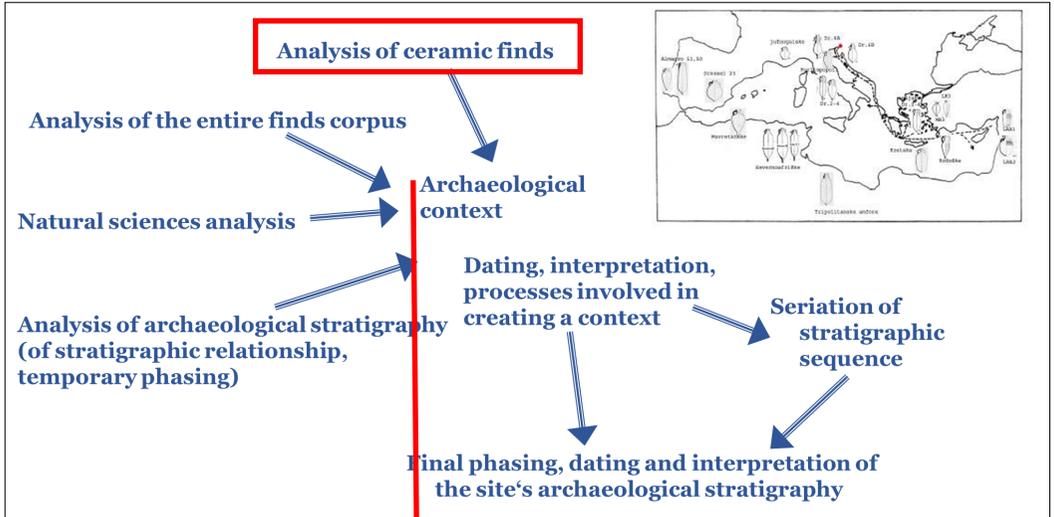
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## Variables relevant for different research objectives

Variable	Nature of deposits	Chronology	Manufacture technology	Production distribution	Function & use	Settlement organisation	Social/cultural expression
Fabric type	*	*	*	*	*	*	
Form type	*	*	*	*	*	*	*
Vessel Type		*	*	*	*	*	*
Extent of form	*	*			*	*	
No. of sherds	*	*	*	*	*	*	*
Weight of sherds	*	*	*	*	*	*	*
Diameter of rim			*		*	*	
% of Rim	*						
Diameter of base		*	*		*	*	
Wall thickness	*		*		*	*	
Height			*		*	*	
Girth/shoulder			*		*	*	
Surface treatment	*		*	*	*	*	*
Decoration	*	*	*	*	*	*	*
Manufacturing technique		*	*	*		*	*
Residues				*	*	*	
Perforation type			*	*	*	*	
Firing conditions			*	*		*	*
Condition	*	*			*	*	
Colour			*		*		
Re-use				*	*	*	
Cross-context joins	*						

**Diagram of pottery analyses from a site: local Roman pottery from Školarice site**



# Pottery fabric

Figure 1: Pottery fabric record sheet

Pottery Fabric Record						
SITE NAME		SITE CODE		FABRIC CODE		
DISCIBED BY		DATE				
DISCRIPTION						
COMMON NAME				COLOUR		
FIRING	EXT. SURF.	EXT. MAR.	INT. SURF.	INT. MAR.	CORE	
HARDNESS	SOFT	HARD	VERY HARD			
FEEL/TEXTURE	SMOOTH	SOMPY	SANDY	VERY SANDY	GRANULAR	
FRACTURE	CONCHOIDAL	FINE	HACKLEY	TECHNOLOGY		
	SMOOTH	IRREGULAR	LAMINATED	Hand made <input type="checkbox"/>	Wheel made <input type="checkbox"/>	Uncertain <input type="checkbox"/>
INCLUSIONS	FREQUENCY	SORTING	ROUNDING	SPHERICITY	SIZE	TYPE
SOURCE						
DATE RANGE						
NOTES						
CONTEXTS/SSD/PHASES						
CROSS-REFERENCED TO						
PETROLOGY						
AUTHOR						
SAMPLES						
SUMMARY						





## Potential for making scientific publications out of the field report



## Archiving archaeological research

According to the Regulations on Archaeological Research the site archive should include:

- A) All documentation (business, management, documentation about location, excavation records...)
- B) Systematically organized collection of all small finds
- C) Systematically organized collection of all samples

Site archive must be handed over to the authorised museum.



# NGOs as careers in archaeology and heritage: the case of the Center for Urban Development (UDC), Belgrade

Jovana Mijatović and Rade Milić

NGOs can provide extremely valuable contributions to many aspects of our social life. NGOs in the domain of heritage have a very long tradition. What is also very characteristic of NGOs is their flexibility, inventiveness, power to mobilise the public, volunteer work and dedication. NGOs can provide an excellent working milieu, including numerous experts and interested laypersons.

Numerous state governments and international organisations, such as the EU, UNESCO and others, acknowledge the role of NGOs in modern society and frequently support their work. Although NGOs are not profit-oriented enterprises, they present an opportunity for careers in archaeology and heritage.

The Center for Urban Development from Belgrade is an NGO established in 2006. It was developed as a follow-up of the 'Belgrade project' presented at the Venice Architecture Biennale (2006). It is focused on studying and presenting urban and social innovations associated with the capital of Serbia. The general aim is to create and implement initiatives in education, culture, art, urbanism and sustainable development. UDC has a large group of experts and researchers from various fields.

## Our story

- Urban Development Center is a non-government organization specializing in urban and social innovation.
- Established in 2006 as a result of the “Belgrade” project, presented at the Venice Architecture Biennale 2006, received numerous awards and recognitions, with an aim to promote the Capital of Serbia.
- UDC has a large group of experts and researchers from various fields

udc



We have the unique approach to development of urban spaces, people and their interactions.

Cultural heritage is an important part of the urban environment. All cities take great care of the historical traces of their territory. When it comes to the identity of a certain place, the past is an important factor.

The UDC philosophy is that promotion must follow technological development and approach modern man through the up-to-date media. This is the only way to influence the awareness of cultural heritage's importance within future populations' identities. Furthermore, new technology allows us to present the cultural heritage inside urban areas without physical intervention.



# Project TCT@Augmented World Expo, Silicon Valley

## Presentation of the Roman Sirmium



Museums and the Web Hong Kong  
(Augmented reality)



# Project UNDERGRAD

The aim of the UNDERGRAD project is to track data record, research, document and present underground structures and objects located on the territory of Belgrade.



Archeological treasures under the city of Belgrade.

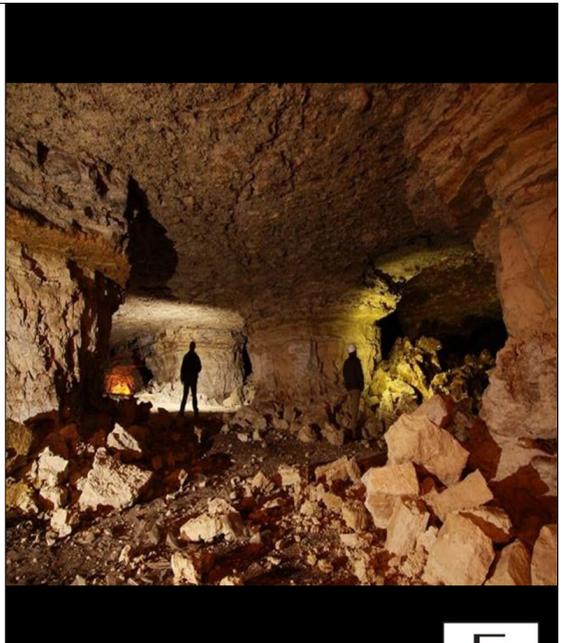


## A City's Identity Marked By Layers of History and Culture

Undiscovered underground chambers witness the tumultuous periods of this city's history.

They represent the heritage of Belgrade -

- the Oriental and Habsburg periods,
- witnesses of industrialization in the 19th century,
- complemented by recently dated spaces, bunkers, tunnels, shelters and secret bases created during the First and Second World Wars.



# Presentation and promotion

By using different digital technologies (and other mediums) we are making experiences that are inviting, both townspeople and tourist, to engage with Belgrade's stories of underground.



## Collection and analysis of documentation

- Collection of scientific material, literature and data related to the Belgrade Underground.
- Analytical research of archival material
- Documentation is systematized and digitized.



**So far, we have documentation of over 100 objects on the territory of Belgrade!**

## Field research

- Reliability examination of archival and bibliographic material.
- Investigation and documentation of field sites that have the potential to be systematically researched and presented to the public.



**So far, we have visited several dozen facilities in Belgrade!**

It was built from 1718 to 1721

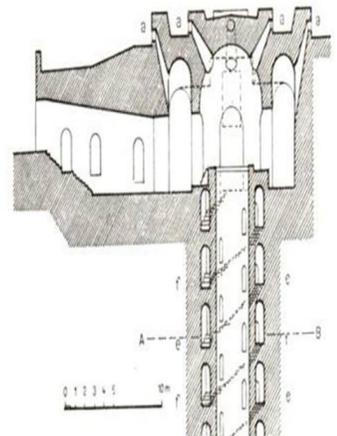


**Large  
gunpowder  
warehouse -  
Lower city of  
Belgrade's  
Fortress - 18th  
century**

Two halls supported by nine pillars each and a large spacious hallway.

## THE ROMAN WELL

Built during the Austrian administration in Belgrade, from 1717 to 1731



A special interactive whiteboard, in addition to the usual tourist information, viewed through the phone's camera is creating augmented reality media experience - the animated 3D model of the goddess Hekate.

## Meet Hekate in Jevremova street



## The Return of Hekate...

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## Project Heritage HUBS

Heritage Hubs brought together young people aged 10-16 from Finland, Serbia and Spain in a two-year programme aimed at exploring, presenting and sharing their cultural heritage and interpreting the heritage of other countries through exchange visits and an e-learning platform. The project was coordinated by the Association of Cultural Heritage Education in Finland (AHEF) in collaboration with La Fundación San Millán de la Cogolla (FSMC) in Spain, Urban Development Centre (UDC) in Serbia, and VITECO e-Learning solutions in Italy (<https://youtu.be/k06XOstPwNk>).



**Felix Romuliana Digital laboratory**

Creating the concept of a new presentation program at the World Heritage Site Gamzigrad-Romuliana, UNESCO / Participation Programme for 2020 - 2021.



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