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UUT13 Inclusive and Frugal Innovation System for Military Technologies and Needs in Ukraine

From the University of Portsmouth: project coordinator – **Dr. Sercan Ozcan**, Reader (Assoc. Prof.) in Innovation & Technology Management, Associate Head of Research and Innovation; **Dr. Emre Cinar**, Senior Lecturer, Departmental Director of Postgraduate Research (DDPGR).

From the Odessa Polytechnic: project coordinator – **Prof. Dr. Svitlana Yermak**, Professor of the Economics Department; **Prof. Dr. Oleksandr Bavyko**, Head of the Entrepreneurship and Trade Department.



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1. The purpose of the project and subjects of the investigation

The project purpose to enhance the innovation capabilities of the Ukrainian military and drive the development of new technologies that can address the country's defense needs based on a newly introduced inclusive and frugal innovation systems.

The subject of the investigation are the various types of frugal innovations used in Ukraine during the war to support military needs, as well as the process of frugal innovation itself and its main stages.

Methodology. The project will adopt a mixed-methods approach, comprising of literature review, stakeholder interviews, case studies and Nvivo coding.



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2. Tasks of the project

Tasks of the project are:

1. To identify the key challenges and opportunities for inclusive innovation systems and frugal innovations for military technologies and needs in Ukraine.
2. To develop a conceptual framework for establishing inclusive innovation systems and frugal innovations specific to the military context in Ukraine.
3. To illustrate the applicability of the developed models and framework in selected areas of various military technologies and needs through the case study approach
4. To propose recommendations to the relevant stakeholders for further use of the relevant framework.



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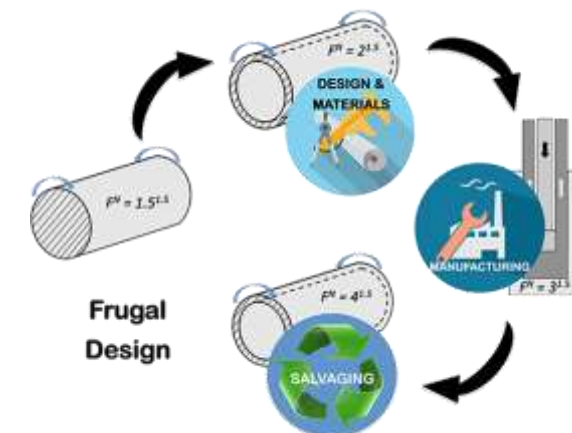
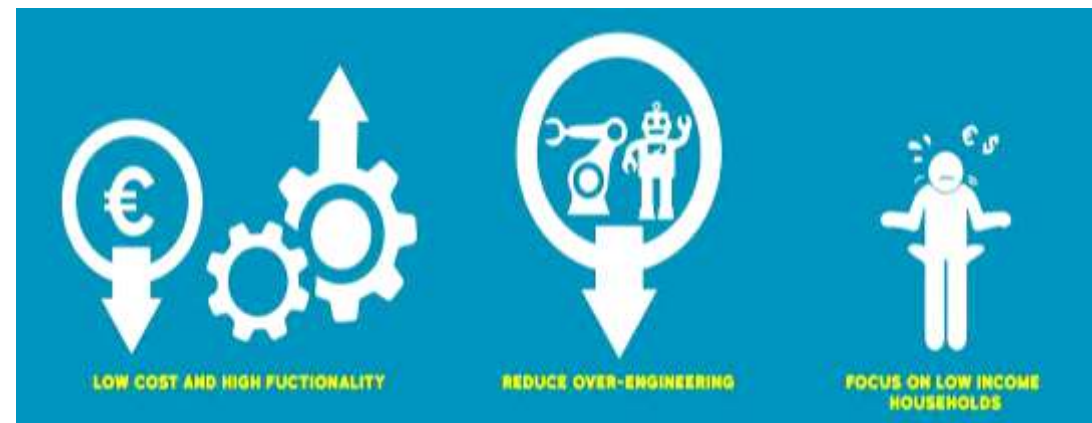
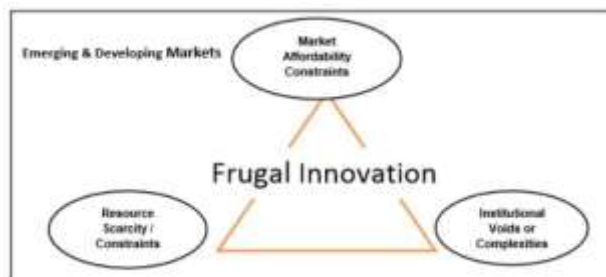
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3. Waiting for project results

Presentation of a joint research paper "Frugal innovation: definition, factors, examples for military needs in Ukraine" at the 7th International Conference on Advanced Research in Business, Management and Economics (ICABME 2023), which will take place on June 16-18, 2023, in Vienna, Austria.

Research paper: Frugal innovation process and a framework for military products. The target journal: Journal of Product Innovation Management.

Further research bid applications to extend the work for other types of inclusive and frugal innovations in Ukraine.





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4. Road map of the project

1) Literature review
and conceptual
framework (CF)

2) Ethics application

3) Interview design
based on the CF

4) Conducting
interviews with the
relevant stakeholders
and secondary data
relevant to this projects

5) Interview data
analysis using NVivo

6) Results and first
draft (first draft to be
submitted to the
conference)

7) Final write up and
editing and submission
(final draft to be
submitted to Research
Policy or Journal of
Product Innovation
Management)

8) Project closure:
report for the project
and also investigation
for other project or
publication
opportunities



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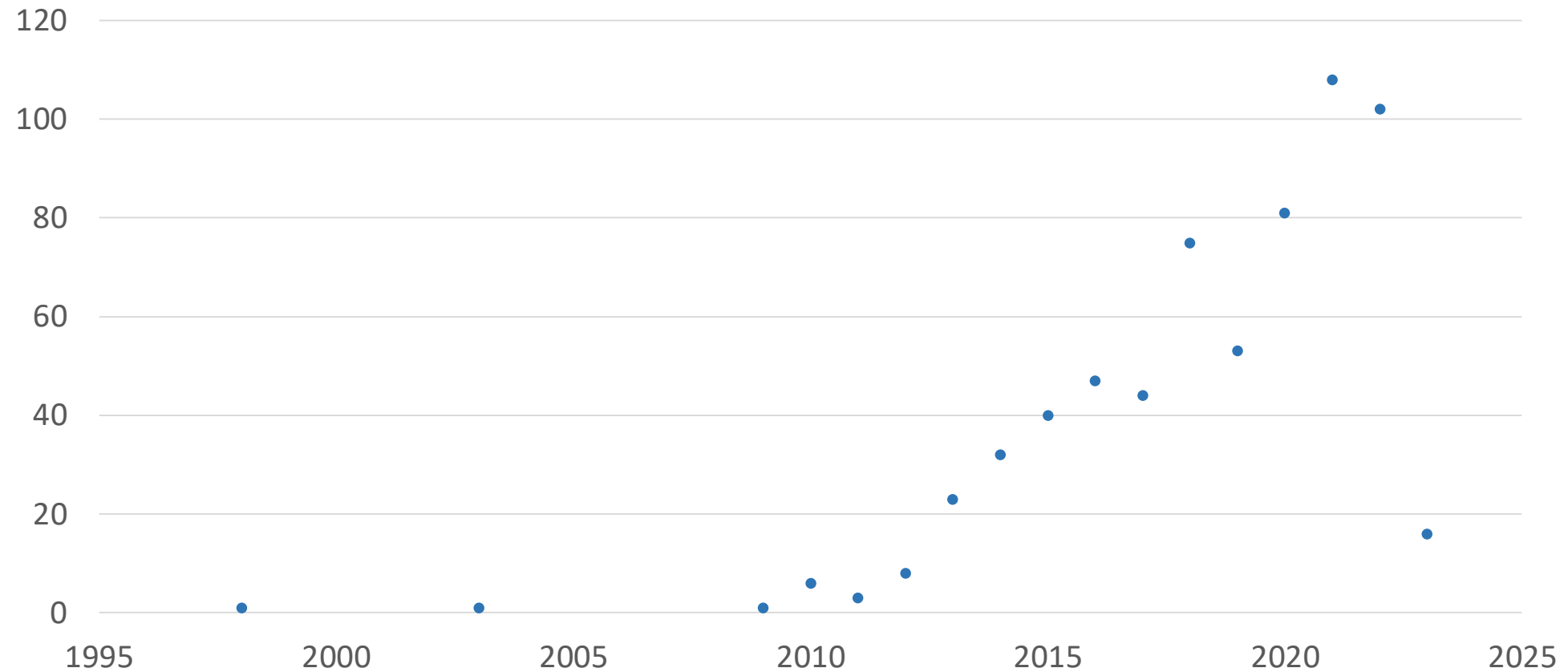
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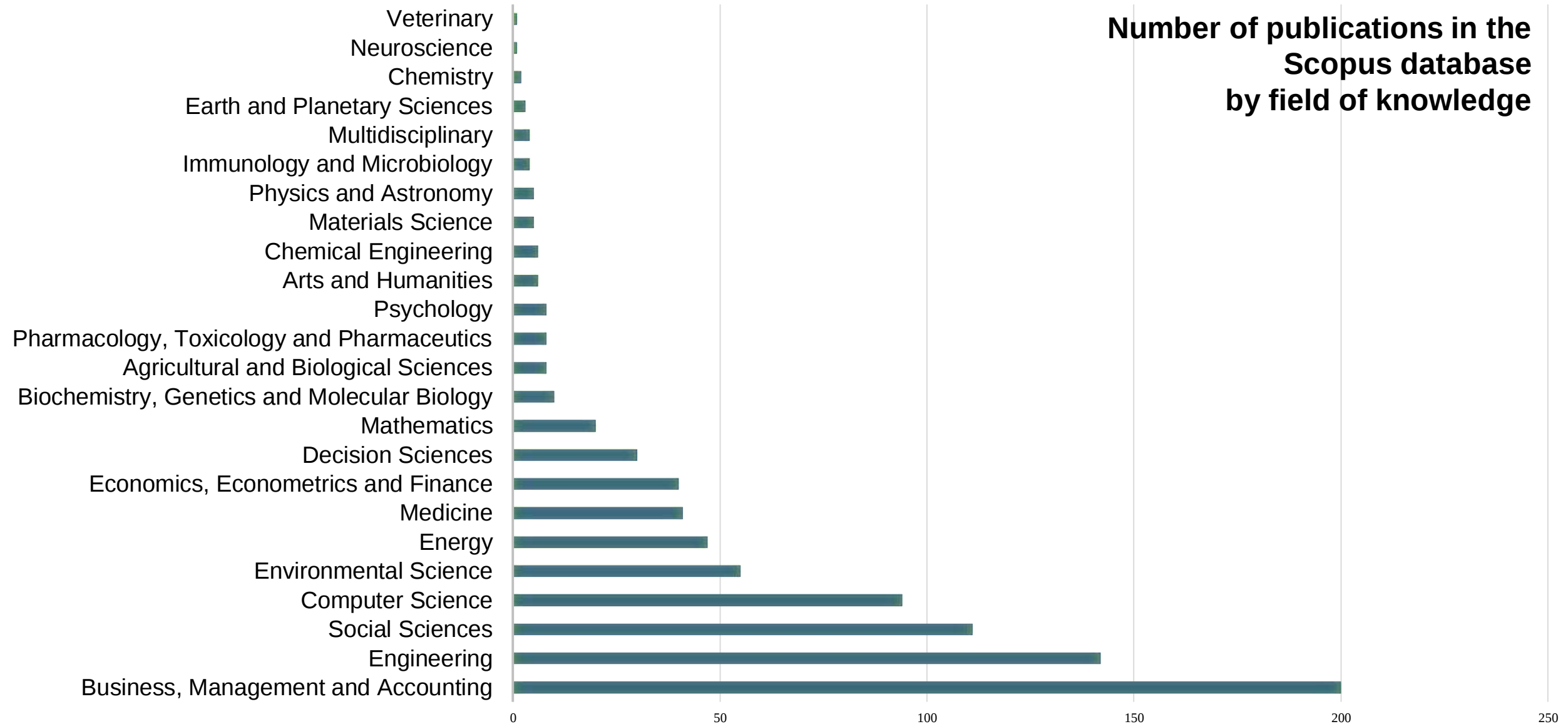
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5. Obtained project results

Dynamics of scientific publications on Frugal innovation in the Scopus database by years



Number of publications in the Scopus database by field of knowledge



FRUGAL INNOVATION

Jugaad
innovation

Reverse
Innovation

Affordable
Innovation

Resource-
Constrained
Innovation

Lean
Innovation

Bottom-up
innovation

Gandian
innovation

Grassroots
innovation

THE MAIN FACTORS OF FRUGAL INNOVATION

Resource
optimization
and cost
reduction

Inclusiveness

Sustainability

Simplified
processes

Entrepreneurial
collaboration
and knowledge
sharing



The **RESOURCE** approach to frugal innovation emphasizes the efficient and effective use of available resources to achieve innovative solutions.



The **PROCESS** approach to frugal innovation focuses on the systematic and iterative processes involved in developing frugal solutions.



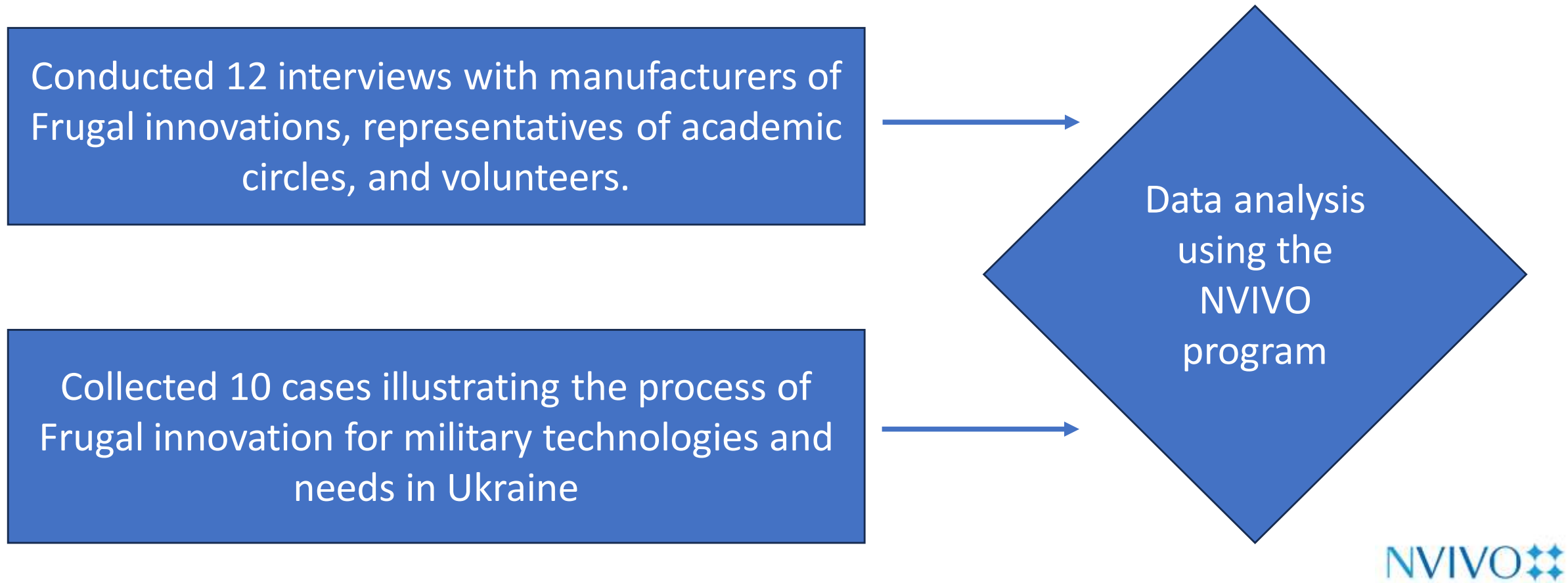
The **SUSTAINABLE** approach to frugal innovation involves developing innovative solutions that not only address affordability and resource constraints but also prioritize environmental sustainability and social impact.



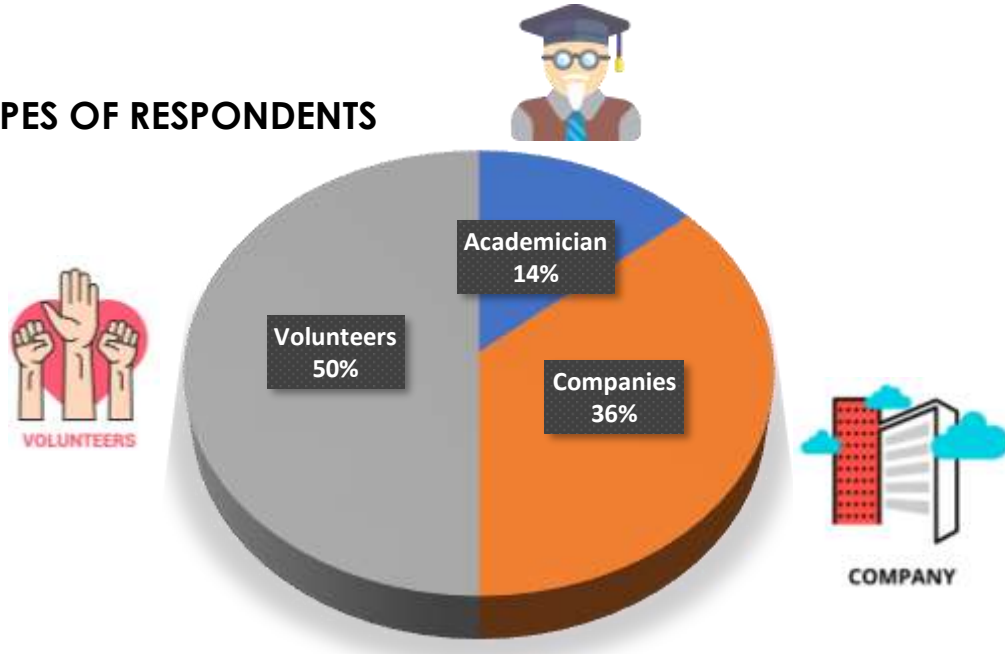
The **ECOSYSTEM** approach to frugal innovation emphasizes the collaborative and interconnected nature of innovation, involving multiple stakeholders and leveraging diverse resources within an ecosystem to drive frugal solutions.



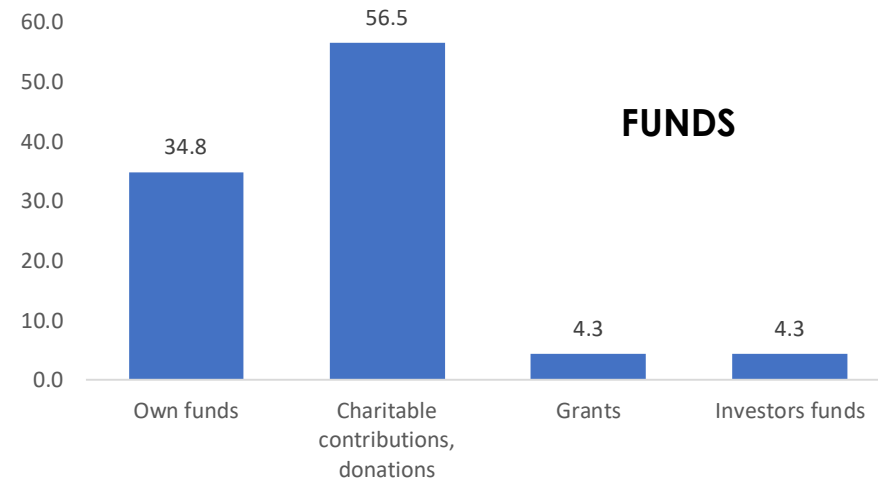
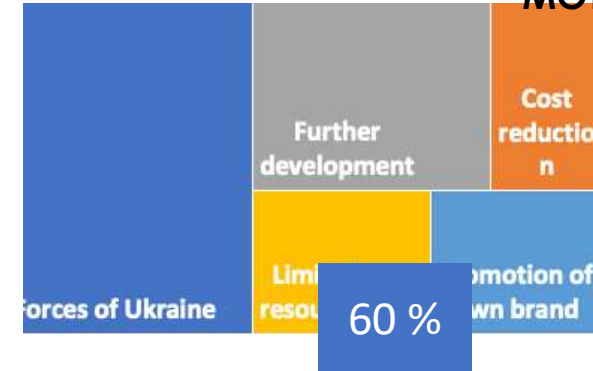
The **INCLUSIVE** approach to frugal innovation emphasizes creating solutions that are accessible, affordable, and beneficial for all segments of society, particularly underserved communities and low-income populations.



TYPES OF RESPONDENTS



MOTIVATION



FUNDS

TYPE OF PRODUCTION

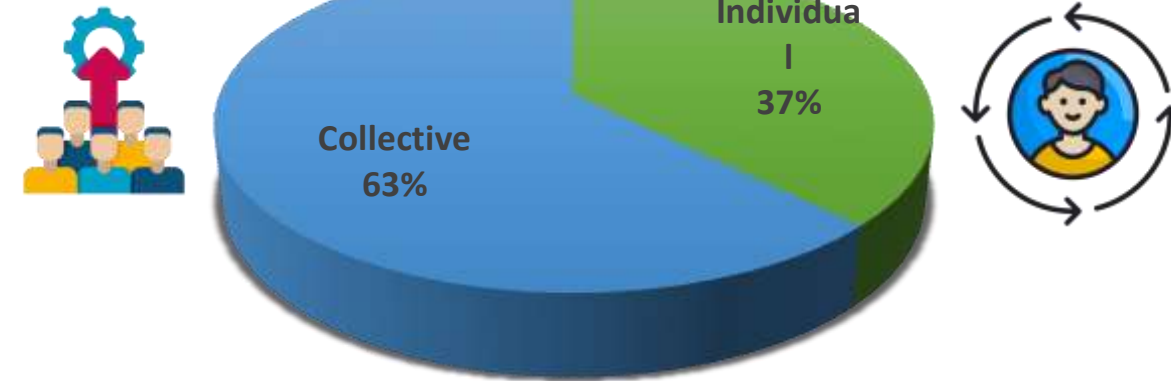




Fig. 4a) Molotov Cocktail (Zahid.net, 2022)



Fig. 4b) A Trench Candle (Which, 2022)



Fig. 4c) Power banks or portable chargers
(Powerbanks, 2022)



Fig. 4d) "Kropyva" software installed on the tablet
(TOP 5, 2023)



Fig. 4e) Chemical Heating Pad (Warmth, 2023)

Examples of frugal innovation application during the war in Ukraine

Molotov Cocktail

Trench Candle

Power banks

"Kropyva" software

Chemical Heating Pad



Self-made RSFS “Grad”

Inflatable models of military equipment



UAV printed on a 3D printer





Camouflage grids

Portable beds for the military





Potbelly stoves made from gas cylinders

Mobile bath and laundry facility



Disposable shower for military



Dry sets of soups and borscht for the military



PROBLEMS



Electricity power outages

Financing

Lack of materials

Lack of specialists

The difficulty of conveying an idea to the community

PUBLICATIONS

1. **Yermak S. Ozcan S., Bavyko O. Variety of frugal innovation terms and their peculiarities.** Materials of the IV International Scientific and Practical Conference "Entrepreneurship and Trade: Development Trends" (May 19, 2023, Odesa, Ukraine). Odesa: Odesa Polytechnic National University. 2023. P.113-115. URL: https://economics.net.ua/files/science/pidpr_i_torg/2023/tezy.pdf
2. **Sercan Ozcan, Emre Cinar, Svitlana Yermak, Oleksandr Bavyko, Iryna Boiko, Ihor Samoilov. Key aspects of inclusive and frugal innovative system research for military technologies and needs in Ukraine.** Materials of the XII International Scientific and Practical Conference "Actual Problems of Management Theory and Practice" (May 26, 2023, Odesa, Ukraine). 2023. P.175-177. URL: <https://economics.net.ua/files/science/men/2023/s7.pdf>
3. **Svitlana Yermak, Sercan Ozcan, Oleksandr Bavyko, Iryna Boiko, Emre Cinar. "Frugal innovation: Definition, Factors, Examples for Military Needs in Ukraine"** Proceedings of The 7th International Conference on Advanced Research in Business, Management and Economics (June 16-18, 2023, Vienna, Austria). URL: <https://www.dpublication.com/abstract-of-7th-icabme/37-2758/>
4. **The manuscript of the scientific article Svitlana Yermak, Sercan Ozcan, Oleksandr Bavyko, Iryna Boiko, Emre Cinar "Frugal innovation: Definition, Factors, Examples for Military Needs in Ukraine"** was prepared.
5. The preparation of the manuscript of the scientific article **Sercan Ozcan, Svitlana Yermak, Oleksandr Bavyko, Emre Cinar "Frugal innovation process and a framework for military products"** is being completed, targeted scientific journal: Journal of Product Innovation Management or Research Policy.

Acknowledgment

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Thank you very much for your attention!

<https://op.edu.ua/en/international/projects/uk-ukraine-twinning-initiative-13>

<https://economics.net.ua/en/uut13>

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