Developing a Household Sustainable Consumption Index Calculator – Marketing and IT Dimensions

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Abstract **– Creating sustainability metrics is one of the means to achieve Goal 12 of the United Nations Sustainable Development Goals. Developing and disseminating sustainability calculators is fundamental to directing the attention of more households towards the sustainability of their own consumption. The purpose of this article is the creation of a measurement tool for sustainable household consumption. It presents the interdisciplinary logic behind calculating an index to measure sustainable consumption at the household level. The software design and software implementation of the calculator are presented, resulting in a working tool that can be widely distributed.**

Keywords **– Sustainable household consumption index, index calculator, program code, Embarcadero Delphi.**

1. Introduction

Sustainable consumption by households is an important starting point for societies in their efforts to achieve the goals of the United Nations for sustainable development.

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This is even more true in today's times, in the conditions of a post-pandemic situation and in the conditions of military conflict on European territory, when food, energy, humanitarian, and refugee crises jeopardize the achievement of the 2030 goals [1]. The latest UN report on achieving the goals of sustainable development shows that under goal 12, "Responsible Consumption and Production," the presence of unsustainable consumption and production structures is the root cause of climate change, biodiversity loss, and pollution. An important point highlighted in the report is that it is crucial to increase investments in data and statistical indicators to track the progress of all processes related to achieving environmental, social, and economic sustainability. In this sense, investing time and effort in creating measures of sustainable consumption is a current task.

The objectives of this article are: (1) to present the logic behind the creation of an index for sustainable household consumption ($SustConsIndex_{household}$), and (2) to develop a software design for an automated calculator to calculate the index.

In the present study, sustainable household consumption is understood as a combination of conscious and/or purposeful actions in the process of searching, purchasing, using, and disposing of products (in the broadest marketing sense) while satisfying individual and group needs. It is manifested through habits, routine actions, deliberate decisions, and actual conditions based on a conscious understanding of the impact of consumption on the ecological, social, and economic aspects of the environment. Within the framework of the implementation of project KP-06-N 35/7 – 18.12.2019 "Sustainable Consumption in the Urban Environment: Regional Differences," financed by the National Science Fund, Bulgaria, a research tool for measuring sustainable household consumption has been developed, which is used as the basis for calculating the index. From September to December 2022, 1068 households from the cities of Varna, Sofia, and Svishtov are interviewed, and the data is used to create the index and the calculator.

2. Literature Review

The process of developing a sustainable consumption index calculator involves marketing and IT professionals. The process is complex and interdisciplinary. The collaborative work of marketing and IT specialists determines the necessity for in-depth knowledge in several directions in both areas. That is why the literature review is divided into two subsections. All marked directions in both areas are important in the process of creating the calculator – as an algorithm and as software.

Subsection 2.1 covers some of the marketing aspects of sustainable consumption which are relevant to this manuscript. Since IT aspects are in many dimensions, subsection 2.2 covers those IT aspects relevant to the research in this manuscript. The literature review on IT aspects reveals some important dimensions in the process of system design, implementation, testing, and deploying newly created software applications. Similar aspects have to be taken in mind by other software specialists and software companies developing new software products.

2.1. Literature Review on Marketing Aspects

Creating indicators for sustainable consumption is not a novel endeavor. Research in this direction has been developing since the early 1970s until the present moment. Analysis of the content of publications on sustainable consumption issues shows a wide variety of proposed indicators. At the same time, it should be noted that there is no consensus which indicators most accurately describe and cover the dynamics of sustainable consumption [2]. In general, there are two main approaches in measuring household sustainable consumption: macro-level measurement and micro-level measurement

In macro-level measurement the focus is on the overall impact of final consumption on resource use [3], [4], [5]. In this approach, indicators are constructed based on the system of national accounts and aggregated data on household consumption from various organizations and institutions. One of the most popular systems of indicators for measuring macro-level sustainable consumption is proposed in 1999 by the Organization for Economic Cooperation and Development (Environment Policy Committee, 1999). The focus of the system is on measuring sustainable consumption at the national level and is developed based on the "Pressure – stress – response" model. Another widely used tool is proposed [5], the Households Sustainable Consumption Index (HSCI), which reflects all aspects of sustainability in consumption (economic, ecological, and social) and allows for direct comparisons between different countries. Official institutions and Eurostat data are used to calculate the index [5]. Generally, macro-level indicators are relatively limited.

There is a significantly greater variety of indicators for measuring sustainable consumption at the micro-level. The main characteristic of micro-level measurements is that they seek to assess the extent to which individuals, families, or households demonstrate concern about their consumption patterns and are mindful of their consumption. In practice, micro-level indicators focus on the degree of sustainable consumption demonstrated at the individual, family, or household level. Typically, these types of indicators work with data on opinions, assessments, judgments, attitudes, and intentions of the individuals surveyed regarding sustainable consumption issues. It should be noted that there is a high degree of fragmentation among the developed instruments in this approach, focusing only on specific aspects of sustainable consumption., An instrument for measuring environmental knowledge and reported environmental practices related to consumption in Malaysia is proposed [6]. No indexes are proposed in this study. A scientific group [7] developed a scale to measure awareness of sustainable consumption, including environmental-friendly consumption, consumption that respects basic social principles, and consumption that is moderate and reasonable [7]. Data from Germany are used in this study. Another group of scientists [8] argued for the MOA model (Motivation, Opportunity, and Ability) to explain sustainable consumption behavior among citizens from the Vietnamese capital regarding energy, transportation, food, water, and waste. No indexes are proposed in their research. In search of answers about stimuli for the transformation from unsustainable to sustainable consumption. Other researchers [9] have applied the theory of consumption values (functional, social, emotional, conditional, and epistemic) as predictors of consumer choice behavior [9]. They have used a 20-point scale in their research with data from Chinese citizens. No indexes are proposed in their study. One frequently cited and used as a starting point in sustainable consumption research is the multi-item scale [10]. The scale can be used to determine the level of sustainability of consumption at an individual level. The authors proof reliability and validity of the scale with consumers from the Middle East. It is difficult to find studies that focus on the development of measurement methodologies that allow grouping individuals/families/households based on their level of sustainability in consumption. One of the tools for assessing the environmental and socio-economic impacts of consumption is the Carbon Footprint Calculator.

There are numerous methodologies for calculating carbon footprint, but they are all based on the consumption-based accounting approach [11], which requires generating data on the quantities of various resources used in households over a specific period of time (usually on an annual basis). Based on this, the total carbon footprint of an individual/family/household is calculated. Studies show that by using similar tools, people focus their attention on the issue and increase their level of commitment regarding the carbon emissions generated as a result of consumption [11].

In this article, sustainable consumption is measured from a micro-level perspective.

2.2. Literature Review on IT aspects

Creating software application is a complex and difficult task. Specialized knowledge in informatics and the field of informatics is needed [12], [13]. The system design consists of several steps which require business analysts [14], [15], [16]. The further programming needs highly qualified IT specialists with substantial background [17], [18], [19]. Moreover, database specialists also are included in the process of software development [20], [21], [22]. The management of the whole process of software development requires managerial specialists with skills in IT service management [23], [24], [25]. On the final steps testers try to find and mark bugs [26], [27], [28]. All these steps in the software creation process are obligatory. Many variances occur. One side is the possible algorithms to be used [29], [30], [31], [32], [33]. On other side, IDEs that may be used [34]. On third side, programing languages [35], [36]. Automatic testing may also be applied for some software applications. Security issues are also actual [37], [38], [39], [40].

3. Methods

The section presents an interdisciplinary perspective (marketing and informational) on the creation of the calculator. The marketing perspective (given in subsection 3.1) argues the characteristics of measuring and encoding responses in the questionnaire with which the calculator starts. On the other hand, the marketing perspective explains the logic behind calculating the Household Sustainable Consumption Index, which is the main result produced by the calculator. The informational perspective (given in subsection 3.2) demonstrates how the program code that ensures the functioning of the application is constructed.

Subsection 3.2 describes some of the aspects of the process of the design and programming of the calculator as a web application.

3.1. Household Sustainable Consumption Index and Calculator Logic

During the creation of the calculator, a seven-step process is followed (Figure 1).

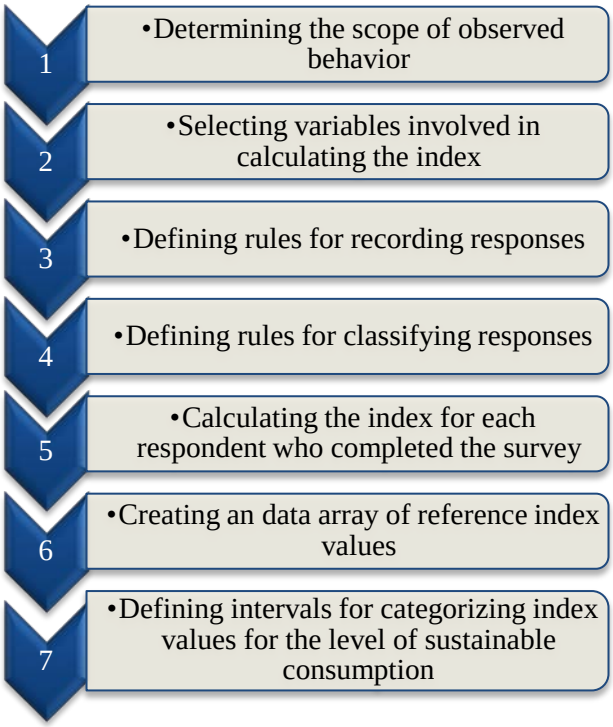

Figure 1. Development process of a household sustainable consumption index calculation
Source: Own elaboration

In the current study, a research instrument created for the purposes of the project "Sustainable Consumption in an Urban Environment: Regional Differences" is used in the "actions for sustainable consumption (housing, food, mobility, and product disposal)" section [41]. This part of the instrument combines a total of 17 variables, including seven single-item and ten multi-items variables (81 items). The variables relate to various aspects of household behavior, such as characteristics of owned housing, possession of appliances and objects in the household, engagement in specific actions (use of different heating methods, disposal of food waste, product disposal methods, waste separation), and the intention to engage in sustainable consumption actions. To calculate the household sustainable consumption index, it is most appropriate to focus attention on variables that can unambiguously be categorized as related to sustainable consumption - ownership and propensity and intention for specific actions.

Ten variables meet these criteria and pertain to the following topics: ownership of appliances, adaptations, devices, and objects related to reducing the consumption of key resources in the household; the intention to perform specific actions leading to reduced energy and water usage; the intention to engage in sustainable actions related to food consumption; the intention to engage in sustainable actions related to urban mobility; the practice of sustainable actions related to product disposal (vehicles, electronic waste, spent batteries, bulky waste, hazardous waste); and the practice of waste separation and disposal. The selected variables are consolidated into a questionnaire that should be completed by a representative of the household (Appendix 1). The encoding of the questions from the full research instrument has been preserved to eliminate the risk of errors when developing an array of reference values for comparison purposes (Step 6 of the process).

To enable index calculation, it is necessary to encode the responses of each respondent who completes the questionnaire, using the following rules:

•Answers to question 14. Each selected answer should be coded with 1. All unselected answer options remain empty.

•Answers to question 16. Each selected answer should be coded with 1. If the answer "none of the above" (16_14) is selected, it should be coded as 0. All other unselected answer options remain empty.

•Answers to question 17. Each selected answer should be coded with 1. If the answer "none of the above" (17_19) is selected, it should be coded as 0. All other unselected answer options remain empty.

•Answers to question 20. Each selected answer should be coded with 1. If the answer "none of the above" (20_9) is selected, it should be coded as 0. All unselected answer options remain empty.

•Answer to question 21. If the respondent has selected an answer from the options: "we sold it for scrap" (4); "we disassembled it and sold the parts" (5); "we took advantage of the government recycling program" (7) or "we dismantle them and send the parts for recycling," it is coded as 1. If any other answer is selected, it is coded as 0.

•Answers to question 22. Each selected answer from the options: "we use the services of a company to transport them from home" (22_4); "we donate them to people in need" (22_5); "we leave them to the church for distribution to those in need" (22_6); "we recycle them as scrap" (22_7) and "we sell them" (22_8) should be coded as 1. Each selected answer among the remaining options should be coded as 0.

•Answers to question 23. Each selected answer from the options: "we leave them by the containers" (23_3); "we donate them to people in need" (23_4); "we leave them to the church for distribution to those in need" (23_5); "we sell them" (23_7); "we recycle them" (23_8); "we use the services of a company to transport them from home" (23_9), and "we disassemble them and use the parts for something else" (23_12) should be coded as 1. Each selected answer among the remaining options should be coded as 0.

•Answers to question 24. Each selected answer from the options: "we don't use batteries at all" (24_1); "we only use rechargeable batteries" (24_2), and "we leave them in special bins in stores and other public buildings" (24_4) should be coded as 1. Each selected answer among the remaining options should be coded as 0.

•Answer to question 25. If the answer "we use the services of a company to transport them from home" (25_4) is selected, it should be coded as 1. Each selected answer among the remaining options should be coded as 0.

•Answer to question 26. If the respondent has selected an answer from the options: "Yes, we practice separate collection and disposal of waste" (1) or "yes, we practice separate collection, but there are no separate disposal containers" (2), it should be coded as 1. If any other answer is selected, it should be coded as 0.

The index is calculated as follows:

1. Sum up all the answers coded as 1 from questions 14, 16, 17, 20, 21, 22, 23, 24, 25, and 26.
2. Divide the obtained sum by 68 (the maximum number of answers that can contribute to the index).
3. Round the resulting sum to the third decimal place.

Each person who completes the questionnaire receives an individual result.

To enable comparison of individual results obtained from completing the questionnaire with results from other households, a data array has been created containing a precalculated household sustainable consumption index. Data from computer-assisted personal interviews with representatives from 1068 households from the cities of Varna, Sofia, and Svishtov during the period of September to December 2022 are used for this purpose.

In order to categorize consumption based on the level of sustainability, interval boundaries for the household sustainable consumption index have been proposed.

They allow for the formation of four main categories:

- 0 – 0,300 – low level of sustainable consumption.
- 0,301 – 0,500 – low to moderate level of sustainable consumption.
- 0,501 – 0,700 – moderate to high level of sustainable consumption.
- 0,701 – 1 – high level of sustainable consumption.

3.2. Software Design of the Web Application „Household Sustainable Consumption Index Calculator“

This subsection describes some key aspects of the process of the design and programming of the calculator as a software application. Parts of the source code are given. Some innovative techniques (such as dynamic creation of web interface items) are presented. The purpose of the software web application „Household sustainable consumption calculator“ is to create a software application that calculates sustainable consumption index on household level. The software web application is created with Embarcadero Delphi. SQL queries are used for adding data in the database and retrieving data from it. The web application (WA) may be loaded on the following web address: http://bi.ue-varna.bg:7777/.

It is created as a wizard application with several web forms (Figure 2).

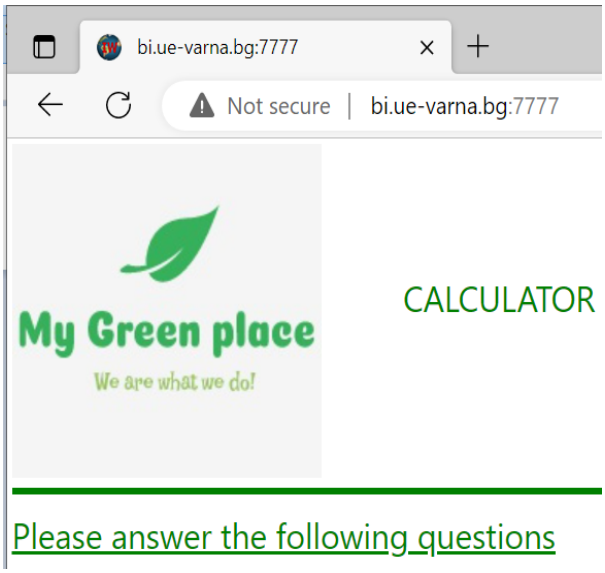

Figure 2. Landing page of the household calculator
Source: Own elaboration

The first step looks like this (Figure 3).

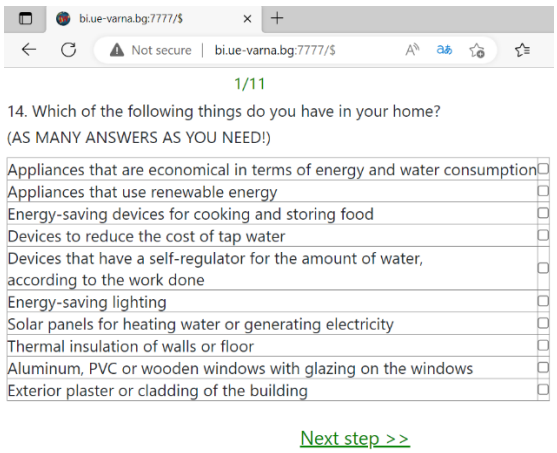

Figure 3. First step of the household calculator
Source: Own elaboration

The library Bootstrap is used for automatic highlighting of cells, when passing with the mouse over them (Figure 4.).

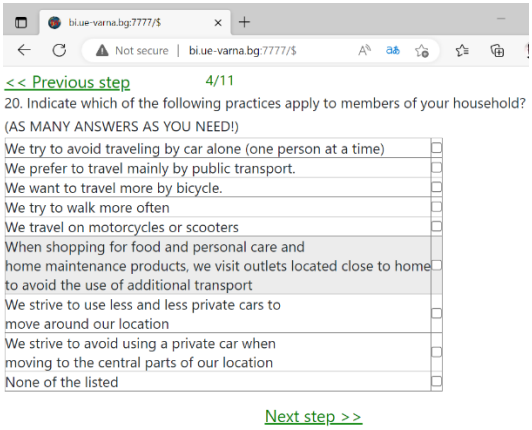

Figure 4. Highlighting cells using Bootstrap library
Source: Own elaboration

Some of the questions have multiple choice answers. Other questions have just one answer (Figure 5).

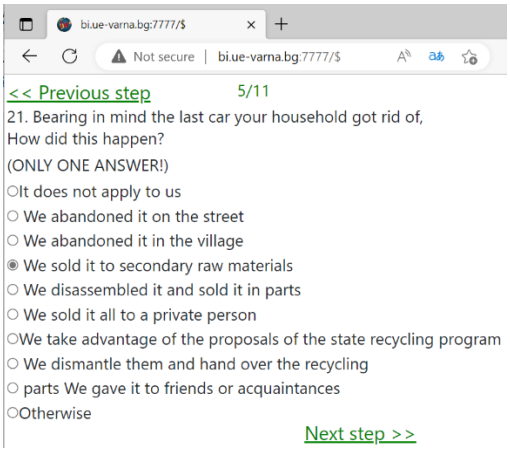

Figure 5. A question with one answer
Source: Own elaboration

Some software aspects will be revealed. All web forms of the wizard are created in the beginning (Figure 6).

```
//
Tfrm20.Create( WebApplication );
//
Tfrm21.Create( WebApplication );
//
Tfrm22.Create( WebApplication );
//
Tfrm23.Create( WebApplication );
```

Figure 6. Creating the web forms of the wizard (a part of the source code)
Source: Own elaboration

Web forms with multiple choice answers contain check boxes. These check boxes are created dynamically (Figure 7).

```
// From the first row to the last row of the Grid
  for aRow := 0 to Grid.RowCount - 1 do
    begin
     // Creating the Check box with parent the current web form
      Grid.Cell[ aRow, 1 ].Control := TIWCheckBox.Create(Self);
     // Giving the created Check Box a component name:
      // cb1, cb2,…, relevant to the row of the Grid
      Grid.Cell[ aRow, 1 ].Control.Name := format( 'cb%d', [ aRow + 1 ] );
      // To store additional integer value (if needed)
      Grid.Cell[ aRow, 1 ].Control.Tag  := aRow;
      // An option to use Bootstrab library for better visualization
      // Grid.Cell[ aRow, 1 ].Control.Css := 'checkbox';
      // Enlarge the check box for user-friendly input
      TIWCheckBox( Grid.Cell[ aRow, 1 ].Control ).Font.Size := 14;
      // Erasing the caption of the check box. The text in the table is used.
     TIWCheckBox( Grid.Cell[ aRow, 1 ].Control ).Caption := '';
      // The text value of the cell with the Check Box is deleted.
      Grid.Cell[ aRow, 1 ].Text := '';
      // End of the for cycle
     end; // for aRow := 1 to Grid.RowCount - 1 do
```

Figure 7. Dynamic creation of Check boxes on questions with multiple answers
Source: Own elaboration

The links for navigation (previous/next) just activate a web form of the web application. Using this approach, the chosen (checked) check boxes are remembered automatically. On the last step information from previous steps is collected for calculating the index (Figure 8).

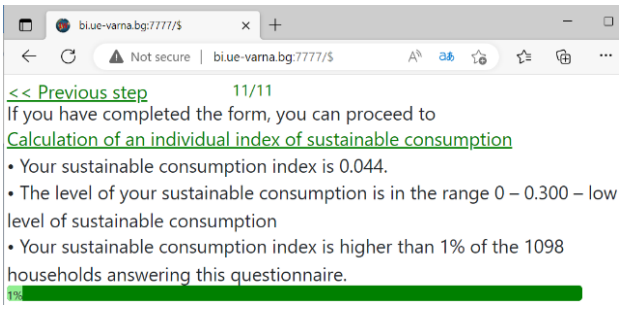

Figure 8. The last step of the calculator after calculating the household sustainable consumption index
Source: Own elaboration

The second bullet of the last web form of the wizard is calculated and visualized in the following way (Figure 9).

```
  // first interval
  if Indiv_index <= 0.3 then
     labReferStojnost.Caption := st + '0 – 0.300 – low level of sustainable consumption';
  //
  // second interval
  if ( Indiv_index >= 0.301 ) and ( Indiv_index <= 0.5 ) then
     labReferStojnost.Caption := st + '0.301 – 0.500 – low to medium level of sustainable consumption';
  //
  // third interval
    if ( Indiv_index >= 0.501 ) and ( Indiv_index <= 0.7 ) then
     labReferStojnost.Caption := st + '0.501 – 0.700 – medium to high level of sustainable consumption';
  //
  // fourth interval
   if ( Indiv_index >= 0.701 ) and ( Indiv_index <= 1 ) then
     labReferStojnost.Caption := st + '0.700 - 1.000 - high level of sustainable consumption';
```

Figure 9. Visualizing the level (low, medium, high) of sustainable consumption
Source: Own elaboration

The third bullet of the last web form of the wizard is calculated and visualized in the following way (Figure 10).

```
  // Retrieve "total number of households with completed individual index"
  sql := 'SELECT Count(Sust_cons_index_base.[ID]) AS CountHaID ' +
        'FROM Sust_cons_index_base';

  // Retrieve "number of households with lower individual index"
  sql := 'SELECT Count(Sust_cons_index_base.[ID]) AS CountHaID ' +
        'FROM Sust_cons_index_base ' +
        'WHERE (((Sust_cons_index_base.Indiv_index)<%.3f))';
    sql := format( sql, [ indiv_index ] );

  // Relative share of these households
  Households_with_lower_index := Round( Households_with_lower_index * 100 / Total_households );


  // Visualizing the third bullet
  st := '• Your sustainable consumption index is higher than %d%% of the %d households that responded to this questionnaire.';
    st := format( st, [ Households_with_lower_index, total_households ] );
    labYourIndexIsGreaterThan.Caption := st;

  // Showing the percent in the Progress bar
  ProgressBar.Percent := Households_with_lower_index;
```

Figure 10. Calculating the last bullet (part of the source code; SQL queries; the lines of code for sending the SQL to the database and returning the result are not given)
Source: Own elaboration

4. Results and Discussion

This section describes the usability of the web application „Household sustainable consumption index calculator“. The web application calculates the index in correct way. The web application works well on different operating systems, different devices and different browsers. The calculated index is saved in table “Sust_cons_index_base”. The table has two columns: ID and Indiv_index.

Data from the web form is stored in another table “Calc_dataset values”. The table has 68 columns (relevant to each element of the index – checked check box or chosen Radio button), date and time, IP of the client, used browser and operating system of the client. These collected data may be used for further analysis.

Additionally, every user of the application receives an instant result upon completing the questionnaire, including: the value of the index, the level of sustainability of their own household consumption, and the percentage of households that have already answered these questions and have a lower result. We believe that such an approach can have a positive effect on reflecting on the way household consumption is conducted, considering whether the household can achieve better results compared to others, and identifying actions that can be taken to improve the level of sustainability in household consumption.

The web application is created with interface (labels) in Bulgarian language, but most of the browsers allow automatic translation into the regional language. So, the web application may be used in any other languages.

5. Conclusion

The aim of this article was to present the logic behind the creation of a household sustainable consumption index and to develop a software design of a web application to calculate the index. The article demonstrated a 7-step process of the logic for calculating the Household sustainable consumption index. Based on this, a web application design for the calculator is proposed. The calculator is published on a website aimed at disseminating information related to sustainable consumption and is already being used by visitors.

The work on this article shows that applying an interdisciplinary approach (marketing and IT) can offer interesting solutions for automating the monitoring processes of household consumption behaviour, ensuring ecological, social, and economic sustainability. Future research could focus on tracking the impact of using the calculator on raising awareness of sustainable consumption and on changes in intentions and attitudes towards the issue of sustainable consumption.

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Appendix 1

The used questionnaire

14. Which of the following things do you have in your home? (AS MANY ANSWERS AS YOU NEED!)

14_1	Appliances that are economical in terms of energy and water consumption	
14_2	Appliances that use renewable energy	
14_3	Energy-saving devices for cooking and food storage	
14_4	Devices for reducing water consumption	
14_5	Appliances with self-regulating water flow based on the task at hand	
14_6	Energy-saving lighting	
14_7	Solar panels for water heating or electricity generation	
14_8	Thermal insulation for walls or floors	
14_9	Aluminum, PVC, or wooden window frames with double glazing	
14_10	Exterior cladding or siding for buildings	

16. Some households are very sensitive to saving electricity and water and, in this regard, DO NOT ALLOW certain practices. Others are less sensitive to saving, and some are not sensitive at all. Which of the following applies to your household? (AS MANY ANSWERS AS YOU NEED!)

		We strive
16_1	We strive NOT to leave lights on when no one is in the rooms.	
16_2	We strive NOT to leave the TV on when no one is in the room.	
16_3	We strive NOT to leave the computer on for long periods without anyone using it.	
16_4	We strive NOT to leave windows open for extended periods when the heating is on.	
16_5	We strive NOT to maintain unreasonably high room temperatures during winter (above 22 degrees).	
16_6	We strive NOT to let the water run while brushing teeth.	
16_7	We strive NOT to run the washing machine with partial loads.	
16_8	We strive NOT to neglect the use of off-peak energy	
16_9	We strive NOT to let the shower run unnecessarily while soaping	
16_10	We strive NOT to use high-temperature programs on the washing machine	
16_11	We strive NOT to let the water run while washing dishes and utensils with detergent	
16_12	We strive NOT to run the dishwasher with partial loads	
16_13	We strive NOT to use the bathtub for every bath	
16_14	None of the above	

17. Please indicate which of the following practices you strive to do in your household?
(AS MANY ANSWERS AS YOU NEED!)

		We strive
17_1	Consume more organic food, certified and available in the commercial network (without artificial additives, chemical preservatives, colorings, flavors, genetically modified organisms, antibiotics, hormones, and other unnatural ingredients)	
17_2	Buy more food directly from the producer	
17_3	Consume more locally produced food (produced in Bulgaria)	
17_4	Consume food and products (fruits, vegetables, meat and meat products, dairy products, etc.) from our own production (personal or from relatives)	
17_5	Consume more homemade food	
17_6	Consume food primarily in biodegradable and/or recyclable packaging	
17_7	Consume mainly seasonal fruits and vegetables	
17_8	Avoid the use of semi-finished and ready-to-eat food	
17_9	Avoid daily consumption of meat	
17_10	Consume more fish and seafood	
17_11	Consume more fruits and vegetables	
17_12	Consume more grains and legumes	
17_13	Pay attention to the type of preservatives (E-numbers) when buying food.	
17_14	Use reusable bags more regularly when buying food	
17_15	Avoid keeping excessive food stocks	
17_16	Reuse nylon bags for shopping	
17_17	Avoid using nylon bags for shopping	
17_18	Convert biodegradable waste into compost	
17_19	None of the above	

20. Indicate which of the following practices apply to members of your household?
(AS MANY ANSWERS AS YOU NEED!)

20_1	We strive to avoid traveling alone in a car (one person per car)	
20_2	We prefer to primarily use public transportation for getting around	
20_3	We strive to use bicycles more for transportation	
20_4	We strive to walk more frequently	
20_5	We use motorcycles or scooters for transportation	
20_6	When shopping for groceries, personal hygiene products, and household maintenance products, we visit stores located near our home to avoid using additional transportation	
20_7	We strive to use our personal car less frequently for getting around in our location	
20_8	We strive to avoid using our personal car when traveling to the central parts of our location	
20_9	None of the above	

21. Considering the most recent light vehicle that your household has disposed of, how did that happen?
(ONLY ONE ANSWER!)

It does not apply to us	1.
We abandoned it on the street	2.
We abandoned it in a rural area	3.
We sold it for scrap	4.
We dismantled it and sold it for parts	5.
We sold it as a whole to a private individual	6.
We took advantage of the government recycling program	7.
We disassembled it and handed the parts for recycling	8.
We gave it as a gift to friends or acquaintances	9.
In another way	10.

22. In what ways have you typically disposed of old household appliances in your household?
(AS MANY ANSWERS AS YOU NEED!)

22_1	We do not dispose of them, we keep them	
22_2	We discard them with the regular waste	
22_3	We leave them next to the containers	
22_4	We use the services of a company to transport them from our home	
22_5	We donate them to people in need	
22_6	We leave them at the church for them to give to those in need	
22_7	We recycle them as secondary raw materials	
22_8	We sell them	
22_9	In another way	
22_10	Until now, we haven't had to dispose of any old household appliances.	

23. Please indicate by which of the following methods you have disposed of bulky waste (sofas, couches, armchairs, tables, chairs, sanitary fixtures, carpets, linoleum, surfaces) in your household? (AS MANY ANSWERS AS YOU NEED!)

23_1	We do not dispose of them, we keep them	
23_2	We discard them with the regular waste	
23_3	We leave them next to the containers	
23_4	We donate them to people in need	
23_5	We leave them at the church for them to give to those in need	
23_6	We burn them	
23_7	We sell them	
23_8	We dispose of them for recycling	
23_9	We use the services of a company to transport them from our home	
23_10	We take them to the countryside	
23_11	We dispose of them at the municipal landfill	
23_12	We dismantle them and use the parts for something else	
23_13	In another way	
23_14	Until now, we haven't had to dispose of bulky waste	

24. Please indicate through which of the following methods you have disposed of used batteries from remote controls, flashlights, etc., in your household?
(AS MANY ANSWERS AS YOU NEED!)

24_1	We do not use batteries at all	
24_2	We only use rechargeable batteries	
24_3	We dispose of them with other waste	
24_4	We leave them in designated bins in stores or other public buildings	
24_5	In another way	
24_6	I don't know/Can't judge	

25. Please indicate which of the following methods you have used to dispose of hazardous waste (medications, electronic devices, paint and varnish materials, packaging from household products and chemicals)?
(AS MANY ANSWERS AS YOU NEED!)

25_1	We don't dispose of them, we keep them	
25_2	We dispose of them with other waste	
25_3	We leave them near the containers	
25_4	We use the services of a company to transport them from our home	
25_5	In another way	
25_6	It doesn't apply to us	

26. Do you practice separate collection of household waste in your household?
(ONLY ONE ANSWER!)

Yes, we practice separate collection and disposal of waste	
Yes, we practice separate collection, but there are no separate disposal containers	
We do not practice separate collection because there are no separate disposal containers	
We do not practice separate collection, even though there are separate disposal containers	