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# ENSURING QUALITY FOR ENROLLMENT, RENEWAL OF REGISTRATION AND CHANGES IN AGRICULTURAL FARM USING INFORMATION TECHNOLOGIES

Abstract: The request for registration, renewal of registration and notification of the change of the data of the family agricultural holding to farmers is submitted in paper form. Agricultural producers have the opportunity to make mistakes in filling, neglecting certain fields, not submitting the request in time, etc. Some of these deficiencies can be solved by creating an electronic form for filling out, with additional explanations for the user and quicker submission of forms. By completing the form of the home and the necessary guidelines for filling up, the created electronic form would have many advantages. In this paper, the methodology for formulating the formulation, as well as the modeling of the same, was proposed, in order to ensure quality in the process of registration, renewal and registration of changes in the agricultural holding.

**Keywords:**E-form, asp.net, agricultural producers

# 1. Introduction

Every holder of a family agricultural farm has to fill many forms during the year. Some of them contains basic data about holder and farm, but some of them are very specific. Specific parts of form contain all parcels with cadastral number and agricultural culture on it. When agricultural producer change culture on specific parcel he should fill and sign form with request for changing culture. All these documents agricultural producer gets in paper.

The goal of the research is ensuring quality of the process with information technologies. Main purpose is related to creation of electronic form with possibility of changing culture on parcels. With the implementation

of the proposed idea agricultural producer could do all the processes (enrolment, renewal of registrations and changes from home) with possibility to check all more times and make smaller number of mistakes.

There are many research papers related to agricultural, but there are small number of papers dealing with ensuring quality of eforms.

Kruize et al. (2016) described software ecosystem for farming and architecture for ICT components developed by multiple vendors in ameaningful, feasible and coherent way. Comparing to the Kruize et al. (2016) proposed research is one of the first steps in achieving farming including ICT.

Lokers et al. (2016) confirmed that Big data technologies create new opportunities for data intensive science in agricultural domain. Related to the statement proposed research give satisfied basis for big data technologies, making the database of answers from agricultural producers.

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Capalbo et al. (2016) gives the most important current limitation in agricultural systems: data. The data are the most important for farm decision support and for research investment. In this aspect proposed E-form gives possibility to store e-data from agricultural producers and use them in appropriate way in order to ensure quality in the domain.

For smart farming needs adequate information technologies, according to Pivoto et al. (2017). In the proposed research we used information technology to get better process of enrolment, renewal of registrations and changes of agricultural farm and get e-data for further analysis and development.

After Introduction we gave briefly methodology of research, and after that section results with discussion and conclusion.

# 2. Methodology

In the research we identified the following tasks:

- Analyze current form
- Define the most appropriate technology for creating E-form

### Create E-form.

Regarding the first step, Figure 1 and Figure 2 present current parts of form for agricultural producers, which they get in paper format. Until now farmers have filled up manually the forms that were used to record data of the parcel size owned by the farmer, as well as the type of plants cultivated on these parcels.

In the second steps, while analyzing current form we have concluded that this view of table is the appropriate for agricultural producer and made the decision that the form should look the similar.

In the third step we have concluded that we will create web form because we want to give possibility to agricultural producers to fill the form through Internet. We have chosen asp.net technology for creating form. NET is a developer platform made up of tools, programming languages, and libraries for building many different types of applications (ASP.NET, Open-source web framework for .NET, 2019).

ASP.NET (Asp.net) extends the .NET developer platform with tools and libraries specifically for building web apps.Like the rest of .NET, ASP.NET is open source on GitHub (GitHub 2019). Figure 3 show asp.net page life cycle.

| PPG Vrsta promene (označiti-x)    |   |                                    |
|-----------------------------------|---|------------------------------------|
| <ul><li>upis u registar</li></ul> | <ul> <li>- obnova registracije</li> </ul> | <ul><li>promena podataka</li></ul> |

Figure 1. The first part of current form

| Ред.<br>бр. | катастарска<br>општина | број кат.<br>парцеле | катастарска<br>култура |    | ршина<br>парцел |                |    | шина у<br>парцел |                | основ<br>коришћења | /да | траја<br>закупа<br>вања<br>ишће | а<br>іна      | шифра<br>културе |    |   | назив биљне културе | површина под<br>културом у<br>текућој години |               | број<br>стабала |  |
|-------------|------------------------|----------------------|------------------------|----|-----------------|----------------|----|------------------|----------------|--------------------|-----|---------------------------------|---------------|------------------|----|---|---------------------|--|---------------|-----------------|--|
|             |                        |                      |                        | xa | ap              | M <sup>2</sup> | xa | ap               | M <sup>2</sup> |                    | дан | мес.                            | год.          |                  |    |   |                     |  | ap            | M <sup>2</sup>  |  |
| 1           | 2                      | 3                    | 4                      |    | 5               |                | 6  |                  | 7              | 8                  |     | 9                               |               |                  | 10 |   | 11                  |  | 12            |                 |  |
|             |                        |                      |                        |    |                 |                |    |                  |                |                    |     |                                 |               |                  |    |   |                     |  |               |                 |  |
|             |                        |                      |                        |    |                 |                |    |                  |                |                    |     |                                 |               |                  |    |   |                     |  |               |                 |  |
|             |                        |                      |                        |    |                 |                |    |                  |                |                    |     |                                 |               |                  |    |   |                     |  |               |                 |  |
|             |                        |                      |                        |    |                 |                |    |                  |                |                    | П   |                                 |               |                  |    |   |                     |  |               |                 |  |
|             |                        |                      |                        | -  | -               | -              | -  |                  | -              |                    | -   |                                 | $\overline{}$ | -                |    | - |                     | -  | $\overline{}$ | -               |  |

Figure 2. The second part of current form

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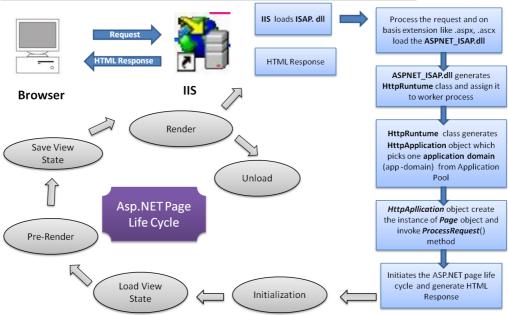


Figure 3. Asp.net page life cycle

## 3. E-form

E-form is created is Web form and it is shown in Figures 4 and 5. The first part gives possibility to user to choose activity enrolment, renewal or registration and place for unique number of every agricultural farm.

The second part of E-form agricultural producers could use for specific data about cultures they have on the farm.

All data in E-form are given in Serbian language and present important data for agricultural farm. These data will be use for furder data analysis.

ОБРАЗАЦ ЗА УПИС И ОБНОВУ РЕГИСТРАЦИЈЕ ПОЉОПРИВРЕДНОГ ГАЗДИНСТВА У РЕГИСТРУ ПОЉОПРИВРЕДНИХ ГАЗДИНСТАВА-ЗЕМЉИШНИ ФОНД И БИЉНЕ КУЛТУРЕ

О Упис у регистар
О Обнова регистрације
О Промена података
БПГ

Figure 4. The first part of E-form

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| Ред. бр.                       |   | Број кат<br>парцеле | Катастарска | Површина<br>целе<br>парцеле | Површина<br>удела у<br>парцели | Основ<br>коришћења | Рок трајања<br>закупа/давања<br>на коришћење |   | Назив<br>биљне | Површина<br>под<br>културом<br>у текућој<br>години | Број | Остаци<br>биомасе |
|--------------------------------|---|---------------------|-------------|-----------------------------|--------------------------------|--------------------|--|---|----------------|--|------|-------------------|
|                                |   |                     |             | ха ар м2                    | ха ар м2                       |                    | дан мес. год.                                |   |                | ха ар м2   |      |                   |
| 1                              | 2 | 3                   | 4           | 5                           | 6                              | 7                  | 8  | 9 | 10             | 11   | 12   | 13                |
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|                                |   |                     |             |                             |                                |                    |  |   |                |  |      |                   |
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|                                |   |                     |             |                             |                                |                    |  |   |                |  |      |                   |
| Датум<br>испуњавања<br>обрасца |   |                     |             |                             |                                |                    | 4 - f F f - m                                |   |                |  |      |                   |

**Figure 5.** The second part of E-form

### 4. Discussion

The created E-form is similar to form on paper, but there are significant advantages:

- Simple use
- Use with basic information technology skills
- Easy change input and correct possible mistakes
- Opportunity for further analysis of data with decision support
- Opportunity for creating "energetic map" with necessary information of biomass.

### 5. Conclusion

According to given presumptions and results we could conlude in two ways:

- Quality of current form is improved in aspects of entering data and future use of data in decision supporting;
- E-form could be more improved in order to help user to even easier input all data.

Enter data in E-form will offers important innovation for farming management practice.

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