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| Technical Analysis  Individual Project: Cellular automaton |
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| 03 | 2016-04-05 | Michał Szklarski | Added summary – overview part. |
| 04 | 2016-04-05 | Michał Szklarski | Extended summary + notion description + general specification |
| 05 | 2016-03-09 | Michał Szklarski | User stories |
| 06 | 2016-03-10 | Michał Szklarski | User stories fixes + conclusion |
| 07 | 2016-03-10 | Michał Szklarski | Non-functional requirements + GUI description, finalizing. |

# Technical Analysis

## Individual Project: Cellular automaton

## Technical specification

### Summary – overview

Aim of this document is to present requirements from the business analysis of a Cellular Automaton application as a technical specification concretization. All implementation details and decisions, such as chosen language, technologies, frameworks, libraries and algorithms will be described in this document. Document is divided into several parts, starting from notion description (dictionary/glossary), general specification description, planned technologies, methodology description, development process flow, algorithm description, diagrams (state, class), UI prototypes and finally: conclusion and last summary about this document.

This document opens path to the implementation process by giving exact directions and decisions, which will be followed by testing phase.

### Notion description

Generation – current representation of cells and they state; can also represent a number – count of cycles from the start of simulation.

Cycle – one run of applying the set of given rules on all cells in grid.

Population – count of cells in current generation.

### General specification

A Cellular Automation software, as described in previous document from the business point of view is a software emulating cellular life.

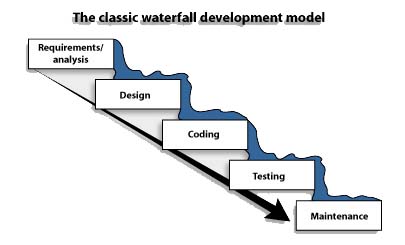
Generally speaking, program will be composed of three main parts: main grid with cells, menus, inputs and buttons (both on main window) for operations and custom rules editor as a separate window. Algorithm handling grid and rules check & enforce policies will be present in the background of whole solution.

### Technologies

As a best suited option for development of such project, **C#** programming language was chosen. Best choice for presentation layer was estimated as a **Windows Presentation Foundation** (WPF) solution. WPF provides a rich and stable API for simple and complex solution, as the one described in this document. It is also well documented, which is an important factor for development process. Main IDE for the project was appointed to be **Visual Studio 2015**, as it is most powerful C# development environment, with integrated **Visual Studio Unit Testing Framework**, that also will be uses here, for testing phase.

### Methodology (development model)

As the business specification is finished now, chosen methodology for this project is **Waterfall**. Due to project complexity, clarity of the requirements, individuality, and course requirements described in initial presentation it is exactly the perfect solution for this assignment. As presented here:



One modification to that diagram is such, that we won’t be handling maintenance phase. Everything up to Testing remains according to the official Waterfall methodology rules. Current phase is determined as Design on the diagram. Each stage has clearly defined goal, therefore it is possible to efficiently control project flow.

### Conclusion

As described in this document, business requirements model and analysis is done. Following remaining part is to prepare technical documentation that will allow determining general overview and details of implementation for such cellular automaton simulation software. All points considered here should be easily translatable into technical language of specific requirements. From there, development processes can finally and properly move on into implementation phase, which is most important in every such project.