

Delft, University of Technology

Product Vision and Planning

Programming Life – Group 2

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Team members on <http://derkje-j.github.com/programming-life/#attribution>

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Preface

This document is a draft for the product vision and planning for the Context Project `Programming Life: Synthetic Biology`. It's a proposition for the project structure, workflow and product target result that we will engage in and with during the period of the course. It contains a schedule with set dates, milestones and goals to be achieved and is a guideline for the work that should be done. The contents of this document are subject to changes and should be regarded as such.

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Introduction

Synthetic biologists simulate the internal workings of cells and their outputs by using combinations of biobricks. By varying the properties of these biobricks, the biologists can measure the output of the cell with differential equations and thus measure the effect the properties that the genotype will have on the phenotype. However, the complexity of the simulation can be daunting if done in a traditional way and is time-consuming.

GigaBase™ is an intuitive application that can use existing biobricks with user-specified properties and environment and simulate the cell. By using this application, the biologists can find the optimal properties more efficiently to maximize the yield of a cell.

Product

This section holds the main product vision, the high-level product backlog and a general roadmap for the contents of the product in the duration of the project.

Product Vision

FOR Synthetic Biologists **WHO LIKE TO** compose genomes that will express a certain phenotype; efficiently turn a substrate into a product, GigaBase™ **IS AN** application **THAT** allows people to create a cell with a certain genotype by selecting modules, their properties and the environment, and simulate the phenotype over time as well as the contents in and outside the cell. **UNLIKE** traditional means of computation and simulation, **OUR SERVICE** provides output optimization, fast-tracked designing over the traditional process and tailored features to their needs.

High-Level Product Backlog

1. A synthetic biologist can see the phenotype output according to the genotype input.
2. A synthetic biologist can convert substrate into product.
3. A synthetic biologist can see the phenotype change over time.
4. A synthetic biologist can select different genotypes.
5. A synthetic biologist can select different cell environmental factors and values.
6. A synthetic biologist can export the results of his/her design to a report.
7. A synthetic biologist can import data from a database, namely partsregistry.org.
8. A synthetic biologist can save and load models.
9. A synthetic biologist can create and edit biobricks.
10. The product is internationalized.
11. Some functionality will be available on mobile platforms.

Roadmap

Month 1

Q3/W4 Draft planning: The product and domain are researched, the product vision and high-level product backlog are devised. Initial list of user stories composed.

Q3/W5 Initial planning: The user story list is fine-tuned and tasks devised for the first sprints. After this sprint all models for the data should be present.

Q3/W6: A basic visualization of the model data should be present. A static genotype can be simulated and the final values presented.

Q3/W7: The genotype is changeable. The output is simulated over time.

Month 2

Q3/W8: A substrate and end product are selectable. Cell environment and factors are changeable.

Q4/W1: The report can be exported and biobricks are imported from partsregistry.org. Prepare for SIG review.

Q4/W2 Demo product: the product should be usable, stable and completed in terms of the items that are considered MUST.

Q4/W3: Incorporate demo test results into backlog and revise tasks for the last month.

Month 3

Q4/W4: New biobricks and modules can be added. Compositions can be saved and loaded.

Q4/W5: The product gives suggestions for the composition of the cell to optimize the yield from substrate to product.

Q4/W6: The product is internationalized. Initial rigorous acceptance tests.

Q4/W7: Bug-fixes, acceptance tests and final review of code. Prepare for SIG review.

Q4/W8 Final product: the product should be usable, stable and completed in terms of the items that are considered MUST and SHOULD.

Product backlog

The product backlog currently only has the features because there is no code yet. So defects or technical improvements will be added later. Further additions to the user stories will be made next week before the initial product vision. Comments should be added as well as other heads-ups and requirements for certain stories.

A synthetic biologist can create a cell from biobricks. *6 hours*

A synthetic biologist see the phenotype corresponding to a genotype. *8 hours*

A synthetic biologist can model reactions of a cell with a substrate. *4 hours*

A synthetic biologist can model cell reactions over time. *6 hours*

A synthetic biologist can swap one biobrick for another. *2 hours*

A synthetic biologist can add modules. *6 hours*

A synthetic biologist can generate a report of a cell reaction over time. *6 hours*

A synthetic biologist can automatically optimize a reaction. *6 hours*

A synthetic biologist can create biobricks. *8 hours*

A synthetic biologist can edit biobricks. *4 hours*

A synthetic biologist can see the phenotype of a biobrick. *4 hours*

A synthetic biologist can select parts from the partsregistry.org database. *2 hours*

A synthetic biologist can add existing parts to the local database. *4 hours*

A synthetic biologist can add existing parts to partsregistry. *2 hours*

A synthetic biologist can save and load a modeling setup. *2 hours*

A synthetic biologist can change the language. *4 hours*

A synthetic biologist can view a phenotype on his phone. *8 hours*

A synthetic biologist can edit a genotype on his phone. *6 hours*

A synthetic biologist can create biobricks on his phone. *8 hours*

Definition of Done

Task: If the description is fulfilled and this can be verified with a *user* and/or an *integration test*.

User Story: If the story is fulfilled and this can be tested with an *acceptance test*.

Sprint: Sunday 23:59

(version of a) **Product/Release:** If the product can be shipped to the *stakeholder*.

Project: Never or when the *stakeholder* decides (after 3 months).