



D7.2: Initial functional prototype

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Abstract

An early low-fidelity prototype of the system, using scripted interactions to compensate for functionalities that are still under development is required to kick-start the process of gathering targeted user input from tasks performed by WP2, which will provide feedback for future iterations of the prototype. Technical integration efforts are underway to connect the Holistic Behaviour Analysis Framework, Knowledge Base, Dialogue & Argumentation Framework and Virtual Agent Platforms (ASAP and GRETA). From its current state, a scripted demonstrator has been developed that showcases the Council of Coaches concept.

Corrections

v1.0.1 Correctly applied EU logo on header page.

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Symbols, abbreviations and acronyms

ASAP	Articulated Social Agents Platform
BML	Behaviour Markup Language
CI	Continuous Integration
CMC	Centre for Monitoring and Coaching
COUCH	Council of Coaches
D	Deliverable
DBT	Danish Board of Technology Foundation
DGEP	Dialogue Game Execution Platform
EC	European Commission
HBAF	Holistic Behaviour Analysis Framework
ISPRINT	Innovation Sprint
M	Month
MS	Milestone
RRD	Roessingh Research and Development
RRI	Responsible Research and Innovation
UDun	University of Dundee
SU	Sorbonne University
UPV	Universitat Politècnica de València
UT	University of Twente
WP	Work Package

1 Introduction

This document is structured by first describing the integration and development effort known as the Technical Integration Taskforce, and the Demonstrator it produced. Then the Initial Functional Prototype is explained, and why it is different from the Demonstrator. This is all part of section 3.

The second part of the document, in section 4, outlines the steps to follow to install and execute the Initial Functional Prototype, and includes links to the current version of the software and the required prerequisites.

2 Objectives

This is the first of a collection of deliverables that report the progressing status of the prototype system of Council of Coaches:

- **D7.2: Initial functional prototype (M9):** An early low-fidelity prototype of the system, using Wizard-of-Oz methodologies to compensate for functionalities that are still under development.
- **D7.3: Second functional prototype (M15):** Focused on delivering a more real and smooth user experience, including a major update to the contents (dialogue possibilities) delivered.
- **D7.4: Third functional prototype (M21):** Used to test acceptance and usability of more advanced features (agent animations and behaviours, interaction concepts).
- **D7.5: Final Council of Coaches Technical Prototype (M27):** Include all the innovations connecting Shared Knowledge Base, Holistic Sensing Framework with autonomous Dialogue Framework and Embodied Conversational Agents to deliver a fully working system.

From the reporting perspective, this document acts as a reference pointing to all the actual source code, binaries, executables, all the software and accompanying instructions that build up the Initial Functional Prototype. Altogether, this deliverable document and the referenced material, are the delivered Initial Functional Prototype.

In order to achieve this, this document targets two objectives:

Objective 1: To report the work done in creating the first prototype since the beginning of the project until the release date.

Objective 2: To provide links to the Initial Functional Prototype software and document how to execute it.

3 Development process

3.1 Code hosting

In order to collaborate in the development of the Initial Functional Prototype, a proper code-hosting solution had to be adopted to allow all partners to contribute their existing work and unify it into a single codebase that would lead to the prototype. A handful of code-hosting solutions were studied, including GitHub or hosting our own server solution. In the end, GitLab was chosen for several reasons:

- It allows us to create multiple code repositories per project.
- These repositories can be made private, allowing access only to those developers we decide.
- Once we decide, those private repositories can be made public, exposing them to a widely known open source community.
- It is integrated with many additional tools for Continuous Integration (CI), analytics, issue tracking and documentation.
- It is hosted by GitLab itself, saving us from having to deploy and maintain our own server solution.
- It is free.

3.2 Technical Integration Taskforce

During the project kick-off meeting, it was identified that many of the components that will make up the final COUCH system already existed in initial or proof-of-concept forms. It was therefore decided to form a Technical Integration Taskforce, charged with producing an initial integration of these components into a technical Demonstrator. This integration process would also be used to, where necessary, revise the project's technical architecture. It would also allow to, at some point, extract an Initial Functional Prototype (what is reported in this deliverable) while the Taskforce could continue to develop the Demonstrator further into the final COUCH system. The differences between the Initial Functional Prototype and the Demonstrator are further described in section 3.2.3.

3.2.1 Workshop 1

The first workshop of the Technical Integration Taskforce was held in Valencia, Spain from 6th-7th March 2018. The aims of this first workshop were:

1. For each partner to gain an insight into existing components from other partners, including their function, required inputs, and generated outputs.
2. To identify the necessary connections between existing components and, where necessary, what additional components might be required.
3. To design a first draft of the architecture for the Initial Functional Prototype based on the identified connections.
4. To code an initial implementation towards the development of the Initial Functional Prototype.
5. To ensure that RRI issues were considered during the development process.

Concrete technical outcomes from this workshop, which were uploaded to the code hosting repository in GitLab, were:

1. The first draft of the architecture for both the Initial Functional Prototype and the overall integrated Demonstrator, leading to the envisaged final COUCH system, to be reported in D7.1.
2. A modification of the Dialogue Game Execution Platform (DGEP) to support a message-oriented architecture.
3. The ability to send Behaviour Markup Language (BML) from Flipper and Behaviour Planner, via ActiveMQ, into the ASAP and Greta platforms.

These outcomes laid a solid foundation which was subsequently built upon in the second workshop in Enschede (see Section 3.2.2 below).

3.2.2 Workshop 2

Immediately following the Valencia workshop, it was agreed that a second workshop should be held to continue the integration activities, and that it should be as soon as possible so as to maintain momentum. A second workshop was therefore held in Enschede from 23rd-26th April 2018. The aims of this workshop were to:

1. Revise, update and refine the draft architecture.
2. Develop a working Demonstrator incorporating all (adapted) existing components.
3. Ensure there was continued consideration of RRI issues.

Concrete technical outcomes from this workshop were:

1. An improved and more detailed functional architecture, to be reported in D7.1.
2. Full integration between DGEP, Flipper, ASAP and Greta.
3. An expansion of the set of sample dialogues that will be used to demonstrate the Initial Functional Prototype.
4. Enhanced designs of the graphical representation and actual movement repertoire of the coaches according to the personality descriptions.

Furthermore, significant progress was made towards the functional relationship between the sensor acquisition module and processing module within the Holistic Behaviour Analysis Framework (HBAF), and the shared knowledge base.

3.2.3 Release of the Initial Functional Prototype

Compared to the work done in the Demonstrator the functional demonstrator is less complex. There is only one BML realizer integrated and dialogue is scripted. The argumentation framework (DGEP), dialogue manager (Flipper), Holistic Behaviour Analysis Framework (HBAF) and knowledge base are not integrated in the Initial Functional Prototype. The goal of the Initial Functional Prototype is showcase the concept of a multi character coaching session where users can experience an interaction with multiple coaches. A screen capture of the user interface of the Initial Functional Prototype can be found in Figure 1. A short movie of an interaction with the first functional demonstrator can be found on YouTube:

<https://www.youtube.com/watch?v=xWSIXbdGrWE>

The first functional demonstrator will consist of three of our coaches (Embodied Conversational Coaches) sitting in a 3D Council of Coaches meeting room together to talk to the user. The user interface will have buttons where preselected answers can be given by the user to the coaches. The coaching session is a scripted session. The characters and dialogues are based on the work done in the character and personality design taskforce described in D6.2. The embodied conversational coaches in this First Initial Prototype are currently rendered by using the ASAP system in Unity. Verbal and nonverbal behaviour are defined in the Behaviour Markup Language (BML).



Figure 1: Screen capture from the functional prototype. Three coaches and buttons for interaction in the upper left corner.

4 Prototype software

The deliverables that report the future versions of the prototype will include here a detailed collection of all the links leading to the source code, binaries and documentation of each individual module composing the overall COUCH system.

Such structure is already visible in the Demonstrator in GitLab (<https://gitlab.com/CouncilOfCoaches/TechnicalDemonstrator>)¹ but as of now the Initial Functional Prototype is a standalone solution that requires less references and instructions:

4.1 Pre-requisites

To be able to run the first functional demonstrator you need a Windows 64 bit computer with Java Development Kit 1.8: <http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>

A decent computer with a 3D graphics card is also recommended for this first non-optimized demonstrator.

4.2 Installation

Download the following zip file (3.5 GB) and extract it:

<http://www.council-of-coaches.eu/downloads/council-of-coaches-demonstrator-1.zip>

Note: Please extract to a folder that is not too deep within the filesystem (e.g. C:\COUCH\) to prevent errors caused by too long file paths.

Note: The extraction process may take some time.

Note: It is possible that an antivirus request pops up if using Windows Defender, please ignore it.

Double click on "start_Functional_Demonstrator.bat" to start the Initial Functional Prototype. This may prompt a security warning about unknown author of the executable. This can be ignored to continue with the execution.

4.3 Execution

You will see three coaches sitting at a table. Start the coaching session by clicking the button "Start coaching session". The coaches will start introducing themselves. Users can react by clicking the available buttons on the screen (See Figure 1 or the video mentioned earlier, which is available in <https://www.youtube.com/watch?v=xWSIXbdGrWE>).

To stop the program, press *Alt+Enter* to exit full-screen mode, then close the window and wait for Windows to close the program (force application termination and skip the crash report if needed). Alternatively, the process can be stopped directly from Task Manager.

¹ Access is private for now. Contact project coordinator for obtaining access.