



SPARK

D8.1

PROJECT
PRESENTATION

Approval Status

	NAME AND SURNAME	ROLE IN THE PROJECT	PARTNER
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1. ABSTRACT

This report presents the project SPARK, its main objectives and ambition.
A section is devoted to the presentation of the partners. Eventually, an explanation of the rationale behind the logo is provided.

2. INTRODUCTION

The SPARK project has been funded by the European Union's Horizon 2020 Research and Innovation programme.

The Grant Agreement has been signed on November 2015 and in the following, some project data are provided:

CALL REFERENCE	H2020 – ICT – 2015 – CREATIVITY
GRANT AGREEMENT NO.	688417
START DATE	01-01-2016
DURATION	36 MONTHS
TOTAL BUDGET	3,180,242.50
ESTIMATED EFFORT	374 PMs



3. THE PROJECT CONSORTIUM

7 partners from 5 different EU countries participate in the SPARK project. 3 of them are Universities, 2 partners are creative industries, 1 is a competence center that will provide the SPARK project with the access to several design studios. Eventually, 1 partner is the IT developer. In the following, their logo is accompanied by a summary of the main contribution they will provide to the project.

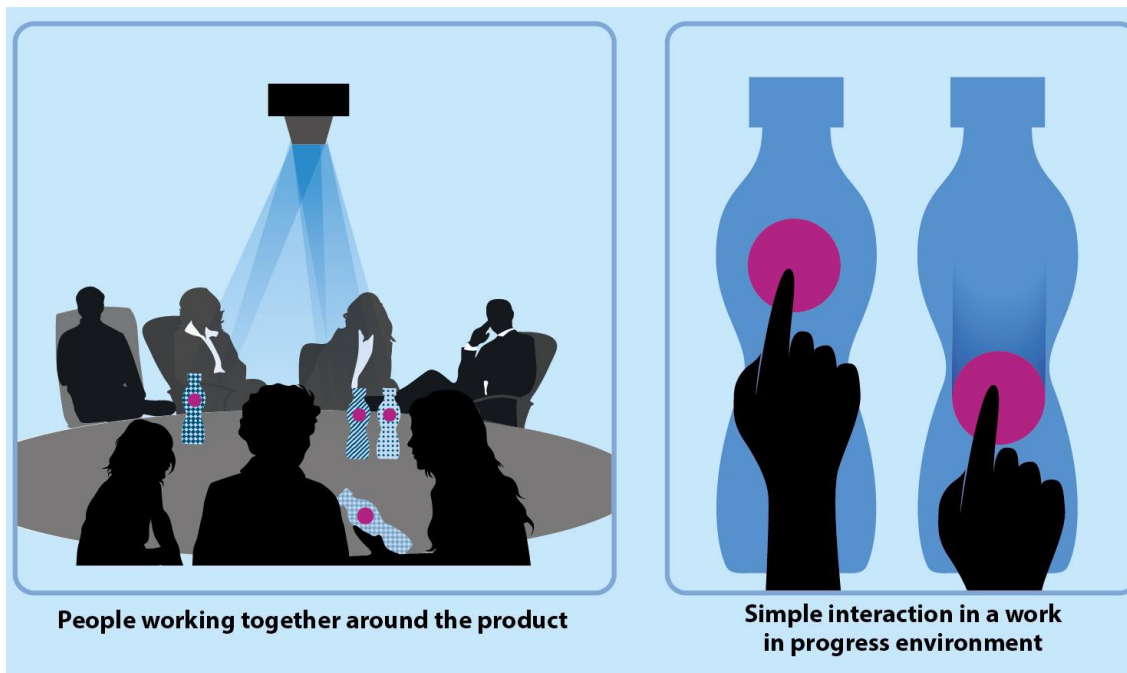
 POLITECNICO MILANO 1863	Coordinator Selection of HW technologies Development of SAR modules Platform testing Dissemination
 #viseospirit	Integration of SPARK Platform Preliminary testing Exploitation
 Grenoble INP	User needs characterization Platform testing and validation Dissemination
 UNIVERSITY OF BATH	User needs characterization Creativity metrics for validation Dissemination
ARTEFICEGROUP BRANDLANGUAGEDESIGN®	End-users preliminary and validation tests demonstration activities
stimulo INNOVATION THROUGH DESIGN	
 VZW FLANDERS INSHAPE	



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.688417.

H2020 ICT201_SPARK_688417

4. THE AMBITION OF SPARK



The SPARK project aims at realizing a responsive ICT platform that exploits the potential of Spatial Augmented Reality for supporting and fostering collaborative creative thinking in the design process.

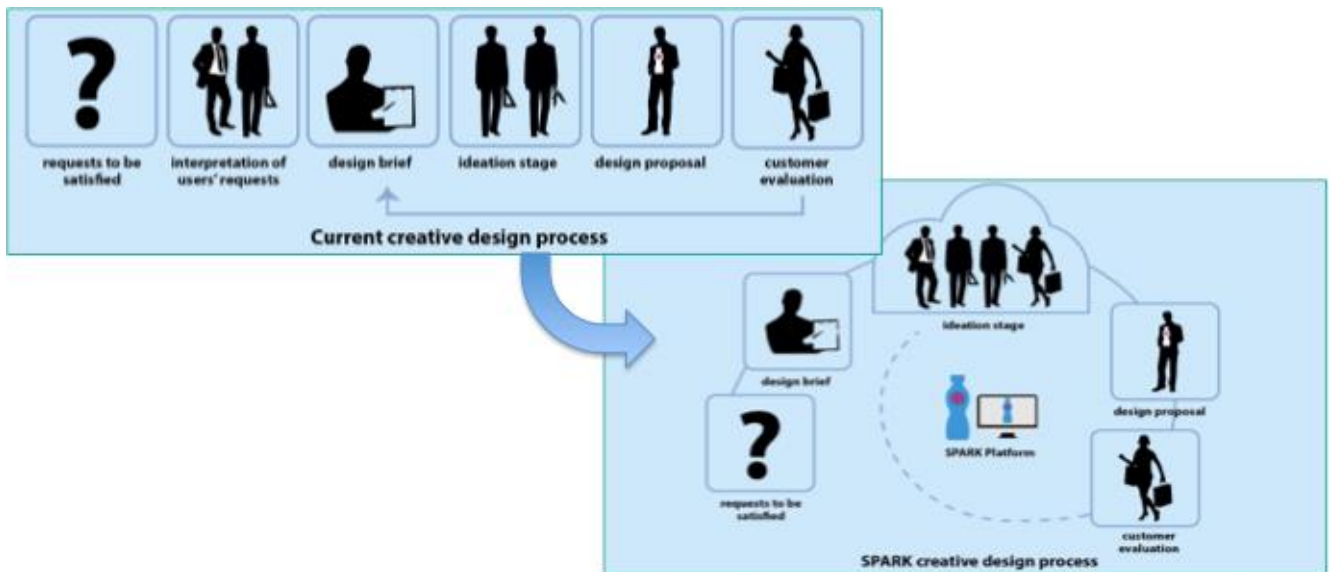
Spatial Augmented Reality enhances the innovation capabilities of creative industries through the facilitation of brainstorming and the early assessment of design solutions in a Co-Design environment.

The SPARK platform aims at radically changing the design cycle by including customers and stakeholders in the early phases of the design process, thus introducing the Co-Design practices up to the earliest phases of the design process.

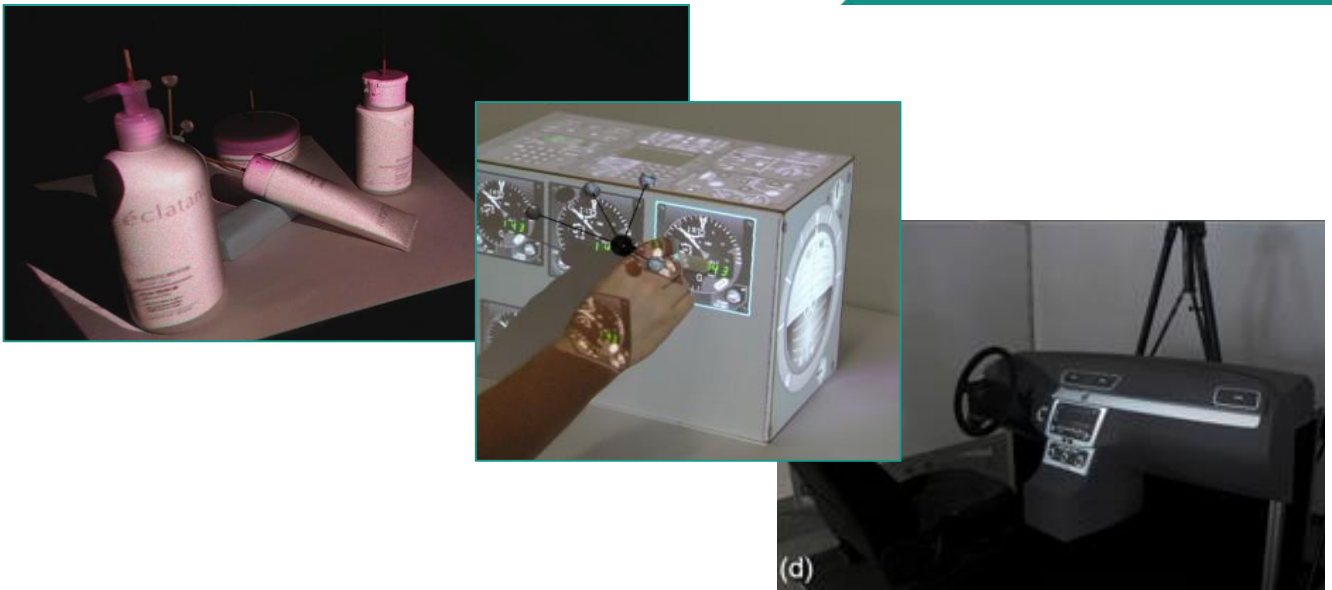
The use of Spatial Augmented Reality technologies allows designers to properly address customers' wishes by designing with them, so as to receive immediate feedbacks on what they, together, see on a tangible shape. This, as well, allows the co-design team to benefit from this open innovation-like structure and generate novel sparks to light up the emergence of an idea and improve the added value of their products.

In this way, a wider number of stakeholders can start playing an active role in the creative brainstorming sessions and provide immediate feedbacks about the goodness of generated ideas, leading to a more effective and efficient design processes. By solely involving those actors in the design process to work together without introducing any "support", it would not be possible to overcome the problems of communication between designers and users/customers. *Therefore, the SPARK platform is necessary to implement a creative environment where all the involved actors can easily share, improve, propose, validate and improve ideas.*



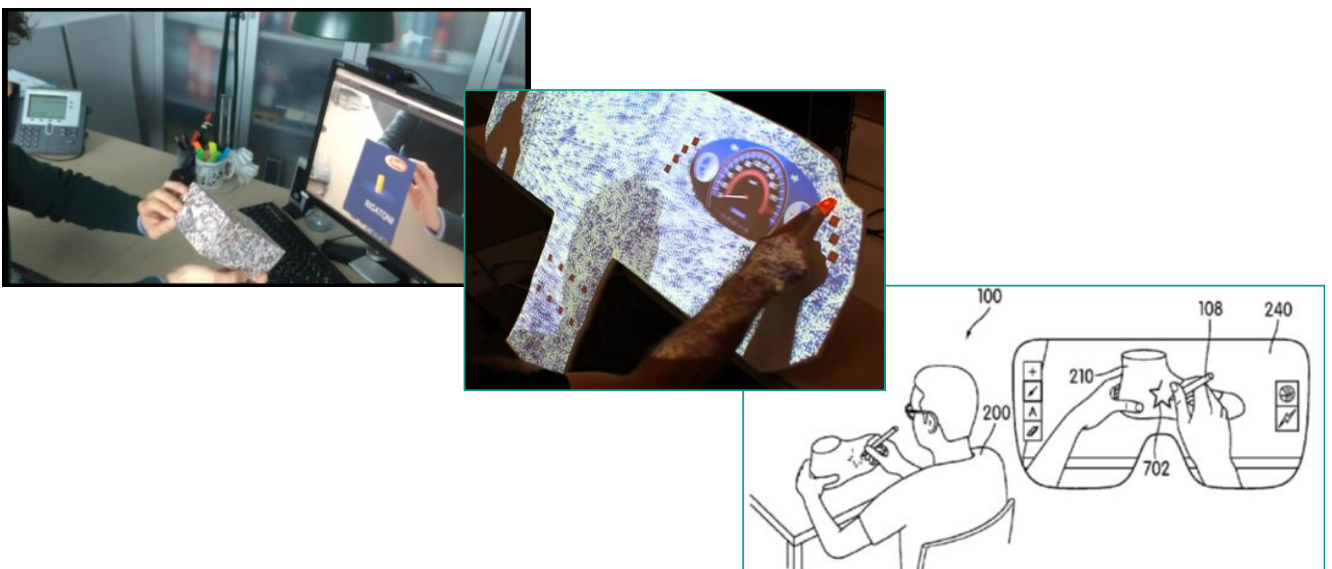


The project will develop and test the SPARK platform. The platform will *enable the direct interaction with a mixed prototype* of a rough shape of the product the designers intend to develop. A mixed prototype of a product is the combination of a physical prototype (usually a rapid one) and a digital prototype (in the shape of structured light to be projected on it, so as to allow the visualization of colours and motifs). It allows the final product to be displayed to designers and customers since the early stage of product development. The physical part of the object defines the rough shape of the mixed prototype, while the digital part of the object virtually represents its external finishing. The external finishing consists in all the visual elements characterizing the aesthetical aspect of the product, or its visual interface. SAR techniques are used to add these elements by projecting them directly onto the real part of the mixed prototype (e.g., the label of a bottle, the packaging of a product, displays and buttons of an appliance, etc.). Visual elements and 3D models used to generate the mixed prototypes will be managed by the SPARK platform.



There, all around the table, designers, customers and stakeholders, according to the different types of products and needs, will interact directly with this mixed prototype by means of the Spatial Augmented Reality technology. The interaction, provided to the SPARK platform users, will allow them to evaluate the overall visual configuration by touching and moving the mixed prototype. *The users of the SPARK platform will be also able to directly modify the finishing onto the mixed prototype by changing its position, orientation and scale of the elements that constitute it.* The direct and quasi-realistic interaction will allow designers and their customers to validate the idea they are conceiving since the very beginning. On the one hand, it will lead to a reduction of "failures" or unproductive iterations and, on the other hand, it will enable the designers as well as the customers to think about novel possibilities of usage, different expressions of the creativity, and so on.

Overall, the SPARK platform will enable the transition of SAR from a technology supporting design review activities (figure above) to a technology supporting design creativity (figure below).



The SPARK platform is in its nature *intuitive* and easy to use. It will allow the users to be more creative, since they will have only to move items, duplicate them, and “rework” on them as many times as needed, since everything will be “virtual”. Not only: by involving the customers since the very beginning, it will be possible for designers to propose different variants having an immediate feedback from the customers. In this way, SPARK will support the design process and in particular the brainstorming phase by accelerating the creative thinking of all the actors involved, and the preliminary assessment of the generated concepts.

This, on the one hand, will lead to a more creative workflow and, on the other hand, to a reduction of numbers of realistic physical prototypes to be produced and therefore a reduction of the related costs and time.

5. THE PROJECT OBJECTIVES

Objective 1 - Analyse the dynamics of co-creative processes of teams dealing with digital and physical prototypes

Objective 2 - Develop a low-cost SAR-based responsive ICT platform, i.e. the SPARK platform

Objective 3 - Study and analyse how and to what extent the SAR technology can stimulate and enhance design creativity through a comparison against pre-defined metrics in real operational design environments

Objective 4 - Demonstrate the effectiveness of the SPARK platform in wider real contexts and show cases

6. LONG-TERM EXPECTED IMPACT OF SPARK

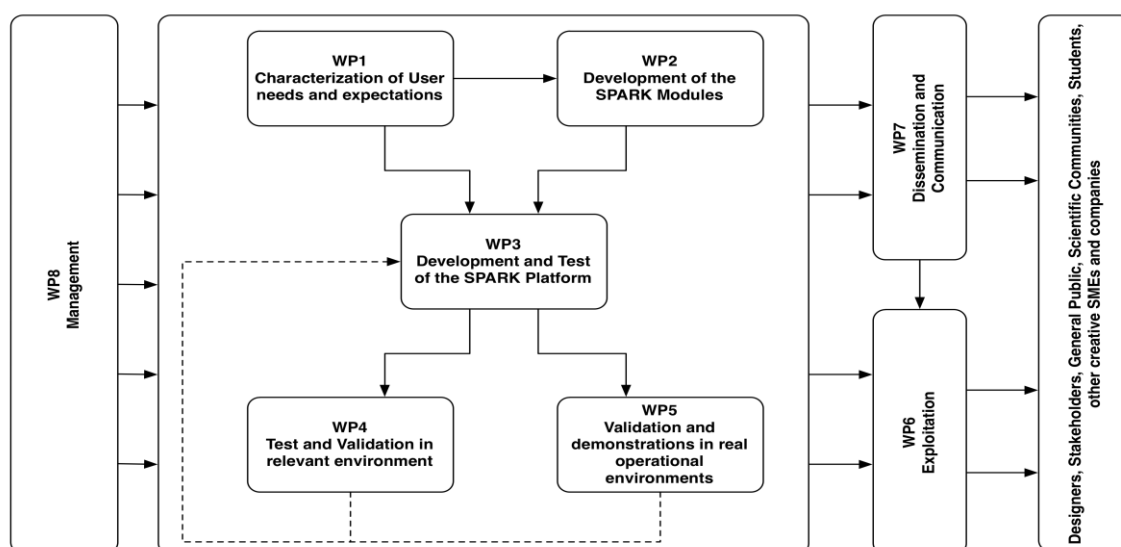
Considering the product development process as a whole, SPARK will impact on the following issues:

- *Time savings.* The amount of time to be dedicated to the whole concept development process with the SPARK platform, from its beginning to the conclusion will be compared with the average time spent on unsupported brainstorming sessions. Thanks to the creativity stimulation and most of all to the reduction of iterations, *it is expected to decrease the time needed to the generation of the preferred concept by 40%.*
- *Human resources involved in the creative projects.* This evaluation aims at better estimating the impact the platform is going to have on the standard business organization of a creative industry by comparing the man-hours spent on a SPARK-supported project with those required in a traditional design process. *It is expected to reduce the human-resources involvement by 25%.*



- *Workload for the whole design process.* The different kind of efforts a person should bear during a demanding task, such as the process of designing will be assessed. *It is expected to reduce the overall workload for the design process, measured in terms of design iterations; the reduction of working documents (number, extent, etc.) to be produced will be used as a further evidence of the workload reduction (-50% expected).*
- *Efficiency of the design process (meant also as quality of the output).* Efficiency of the design process is usually expressed as the ratio between the quantity of successful ideas (or accepted by the customer) and the overall amount of resources spent along the design process. This aspect has a paramount importance for the estimation of the economic impact of the platform. Thanks to the significant facilitation of a Co-Design implementation, *it is expected to increase the efficiency of the design process by more than 70%.*
- *Prototyping costs savings.* This is meant as the costs that the creative companies will be able to reduce thanks to the adoption of SPARK platform and are related to the reduction of number of real prototypes that a creative company will have to produce in order to show to potential customers the variants of a design solution along the development process. The comparison of costs will also take into account the balance with the expenses to manufacture rapid prototypes to be used with the SPARK platform. The expected larger number of variants to be explored with the SPARK platform will be used to both assess costs and time savings.

7. WORKPLAN AND ACTIVITIES



The research and innovation activities will start with the Characterization of users' needs and expectations (WP1). The consortium will cooperate to run tests and interviews to clarify the dynamics of co-design, with specific reference to the interaction among humans and with prototypes. Expert designers will be also interviewed to elicit their experience and make the SPARK platform more responsive to user needs. The output of this WP will be the definition of priorities and requirements for the ICT platform, and will impact both WP2 and WP3.

The activities of WP2 - Development of SPARK modules aim at selecting and validating the most suitable technologies and techniques to be embedded in the platform also on the basis of the specifications provided by the users, which have been defined in WP1. The SPARK platform modules will address aspects, such as visualization, interaction, data management, etc. In principle, the Spatial Augmented Reality (SAR) will be used for the visualization module, while the interaction module will be based on gesture recognition techniques. These modules will provide the user with an intuitive and easy-to-use working environment.

The outputs of WP1 and WP2 will be the basis for the development of the SPARK platform (WP3). As a first activity, the consortium will define the architecture of the whole system, which will have to be intuitive, easy to use and will have to meet the needs of the users for co-creative design. Then, the platform will be developed and a first set of lab tests will be performed, in order to check its functionality (e.g. consistency with functional requirements defined for the ICT platform). Once the first version of the SPARK platform is completed and tested in lab, it will be validated in a relevant operational environment. This means that the creative end users, as well as the stakeholders meaningful for pre-defined case studies, will be invited to take part in testing sessions where the conditions of a real co-design session will be recreated at PoliMI, GINP and UBAH (WP4 - Test and validation in relevant environment). In order to validate the effectiveness and the efficiency of the SPARK platform, the enhancement of designers' creativity using it will be tested against a control group working in standard co-design condition, without the support of SAR.

The feedback and the evaluations obtained during these tests in relevant environment will be fundamental in order to refine and improve the platform. After having revised the platform according to the results of WP4, the platform will be validated in real operational environments with relevant platform users. In order to get as many data as possible, the validation will be conducted at creative industries' premises with professionals from the consortium. Tests will be also carried out with MS/PhD students of the Schools of Design of PoliMI, GINP, UBAH, being them potential future users of the platform. This will also contribute to the further validation and assessment of the ease-of-use and the intuitiveness of the developed platform (WP5 - Validation and demonstrations in real operational environment). Also from this stage, the feedback gathered will be used for the fine-tuning of the platform. After this refinement, the consortium will organise widespread demonstration activities with customers of the creative industries partners of the project, as well as with other creative industries. Finally, *showcases* will be organised in order to increase as much as possible the awareness in the effectiveness and usability of SPARK.

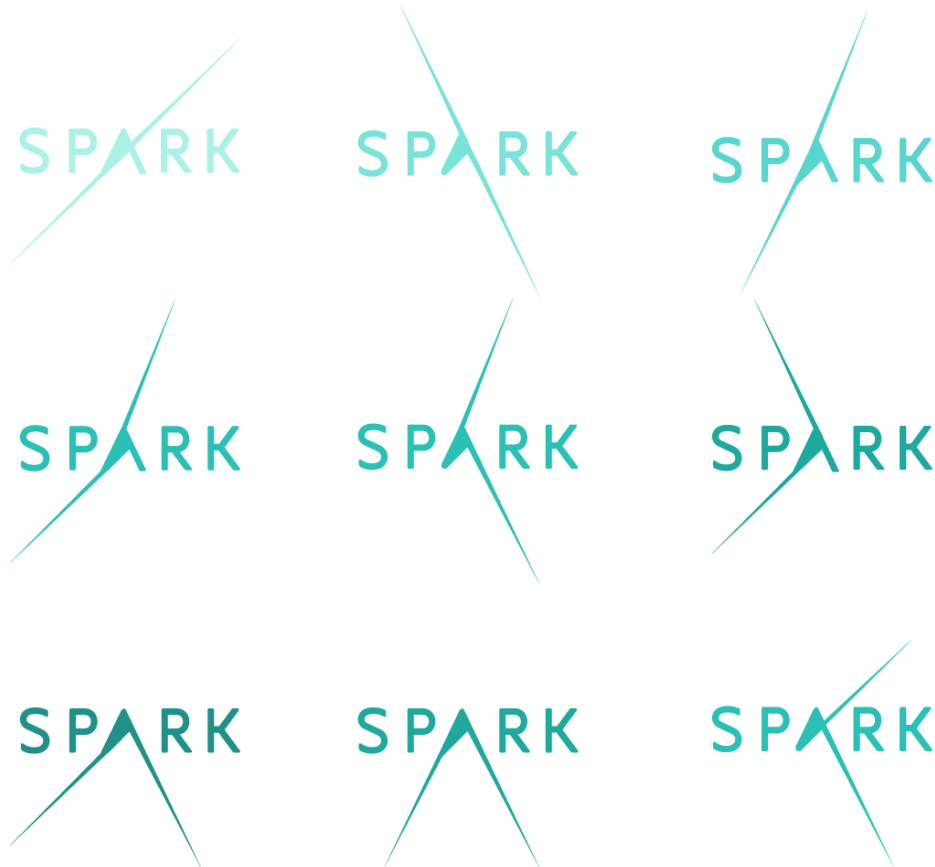


In parallel to the research and innovation activities, a more comprehensive exploitation plan will be defined by Viseo (WP6 - Exploitation), in order to exploit the platform –integrated with product and services they already have in their portfolio-, and by the consortium as a whole for what concerns the scientific and technological know-how and the IP developed within the project activities.

Finally, WP7 (Dissemination & Communication) will run for the whole project and will be completely devoted to dissemination and communication activities, to increase wider awareness of the project, improve the visibility of the project and encourage actions that could be beneficial firstly for creative industries and, as a consequence, also for the society in general.

All the aspects of the technical and administrative management, as well as the quality monitoring of the project and the management of the innovation, will be addressed in WP8 - Management.

8. THE SPARK LOGO



The SPARK logo has been conceived as always in motion. It always changes its direction in order to adapt itself to the different steps and evolutions of the research.

The SPARK logo is a deep gash in the wall.

It 's a spark.

9. FURTHER INFO

For further info, please visit: www.spark-project.net

In addition, it is possible to contact the project coordinator at the following e-mail address: info@spark-project.net

