1st EFFECTIVE Workshop
Paving the way to effective clustering towards exploitation & dissemination of FoF projects results
ComoNExT, Lomazzo (CO), Italy| Wed 1st - Thu 2nd July 2015

Day 1 | Introduction

Franco A. CAVADINI opened the Workshop on behalf of the Coordinator and project partners. He welcomed experts, guests, and project partners present, briefly described aims and activities of the EFFECTIVE action, with a particular focus on clustering, and illustrated the programme of the two days' workshop.

Day 1 | Session 1
Business trends and Market Prospects

Moderator
Mr. Federico BRUGNOLI, Synesis

Speakers
Ms. Cristina SIMONATO, DemoCenter- Sipe
Mr. Daniele VACCHI, IMA
Mr. Omar DEGOLI, Federlegno Arredo

Mr. BRUGNOLI opened the session by thanking speakers and welcoming guests. He introduced the session presenting the key business and demographic megatrends identified in the context of the EFFECTIVE action, namely: (a) shift in demand; (b) new consumers; (c) ageing; (d) customisation; (e) free trade; (f) supply chain variations; (g) business model lifecycles; (h) resource scarcity / economy and (i) talent shortages. He then called for speakers to illustrate trends in their respective fields: med-tech; machinery and production systems, and consumer goods.

Ms. SIMONATO illustrated the experience of the Mirandola (Italy) district in the Emilia-Romagna region, which has a long med- and bio-tech experience, since the mid-1960s. She noted how around half of the med-/bio-tech market rotates around equipment and devices. Key strategic objectives in the regional development plans tackle customised healthcare, healthy and active lifestyles, process innovation in industry and healthcare as well as well-being. Critical aspects from the Mirandola experience were highlighted: (i) the cross-pollination amongst different skills / fields of expertise; (ii) the separation between the "brain" of companies (i.e. R&D labs) – especially larger, multi-national ones – and their "arms" (i.e. production sites), which entails that innovation is developed physically away from production; (iii) due to an increasing shift of the med-tech industry towards the pharmaceuticals sector, the shifts in regulations and, at the same time, of requirements, partially hindering innovation; (iv) a general reluctance to invest in innovation, especially from smaller companies; (v) a country-specific issue linked to the lack of incentives towards innovation due to the poor quality requirements of public tenders, which are a core driver for the sector.

Mr. VACCHI spoke in his double role of spokesperson for ERamiat, the Emilia-Romagna network dedicated to advanced mechanics, and representative of IMA, a world leader in packaging machinery. He illustrated how the new paradigm for advanced mechanics has more to do with physics, chemistry and IT than with

electronics and mechanics, highlighting the need for interdisciplinarity. He stressed the importance of the sub-suppliers network to keep the production system (in a sector which almost exclusively produces "on-demand", bespoke, B2B products) flexible and responsive. He presented SustAINe, a network dedicated to all packaging machinery, which innovates by getting closer to the final customers – an approach paralleled by many a multinational in the latest years, bringing Corporate Social Responsibility (CSR) and brand ethics into production modes in the new "internet era" which has shortened distances between customers and brands, heightening dramatically risks for brand reputation and connected costs. SustAINe aims at addressing the higher costs imposed by sustainability to companies operating in the EU, also targeting energy- and resource-savings. Mr. VACCHI also highlighted how customisation equally applies to machinery, as no two machines are the same. This "individuality" allows companies to establish advantages in their respective territories and leverage local conditions – a process which is already taking place.

Questions addressed the connection to the Manufuture ETP (which exists); the objectives pursued with activities at European Commission level, which mainly target the constitution of a collection of clusters targeting advanced mechanics and automation in various EU Member States, to foster the competitive advantage of the EU at global level and reinforce the connection with end-users and with local brands; and design methodologies to sustain the production of bespoke machinery, which takes advantage of additive, fast prototyping and simulation technologies for roughly 30 percent of its components, as well as leveraging a network of sub-suppliers of proven competence.

Mr. DEGOLI, finally, presented interesting information on trends in the Italian furniture industry, the largest in the EU by numbers and brands (1 in 5 key EU manufacturing districts are in Italy), which, as the majority of consumer goods sectors, is composed overwhelmingly by micro- and SMEs (80% in wood furniture in Italy employ 0 to 9 workers). Several trends refer to analysis carried out specifically for the office furniture sector, which has to face many challenges (ageing working population, massive development of ICT, new modes of working…); these trends include: (a) increased collaboration for performance, (b) re-configurable, modular, flexible spaces, (c) longer working lives = inter-generational workspaces needs adaptability to accommodate different working modes, (d) human-centric approaches ("wellness is the new green"), (e) supporting the increasingly overlap of work and life spaces ("comfortable at work"), (f) reaping the opportunities deriving from the use/development of new materials, sustainable production modes and innovative business models, in terms of performance, customisation and sustainability (circular economy principles, new regulations), (g) reaping benefits of complementarities in requirements amongst sub-sectors (e.g. bathroom/kitchen) to support business growth, (h) managing the dichotomy between the need for further investment (in a chronically under-funded sector) and the steeping costs and complexity of new materials (e.g. nanotechnologies, requiring external expertise) and solutions, (i) changing relationship with customers (customers to partners; "servitisation", i.e. longer, constant relationships; made-to-order attitudes, personalisation and reclaiming traditional/ local techniques…).

Questions addressed the limited size of companies, and thus the need for "best-fit" solutions for available resources, as well as the measures that administrations can adopt to foster innovation in such companies (promotion of mergers, funding cooperation…): in this context it was highlighted how cooperation is administratively manageable (at least in Italy), so that clustering is practiced to increase exports, comparatively reduce overheads and share services – but seldom for innovation. Other questions tackled the matter of how to pay for the additional costs of sustainability, i.e. not only <u>selling</u> sustainability but also <u>funding</u> it: charging customers is not seen as a viable solution, as benefits from resource savings and better performance should be able to cover investments. Additional questions tackled the matter of

customisation, which largely remains a "buzzword", as mass production is still dominating: there is nevertheless a change in demands, and the line of thought is becoming less and less theoretical; also, furniture in particular is already a largely customised product, if only in size: the sector has a dual nature of standard/made-to-measure. There were also suggestions that a servitisation approach could be linked to customisation – nevertheless, selling services rather than products is still seen a difficult for SMEs, while there was a recognition that this process was quite fast in many sectors (music, automotive…).

During the *general discussion* there was an agreement that many of the trends mentioned were brought up in various forms in the overview keynote. Elements – some of them already highlighted in previous sections – were mentioned to illustrate trends in the three industrial areas examined. Further elements were specified: the importance of cross-pollination amongst sectors and disciplines, where specialised knowledge is increasingly needed; the emergence of a middle class in previously import markets was also cited: for instance, higher quality med- and biotech products are now sought for the Chinese market.

From the automation point of view, ageing is an increasingly important factor, both due to the increase in consumption of medicines and in the domotics markets, and to assist mobility and raise in-home services. The emerging middle class offers new markets, with the connected challenges of differentiation, which requires smaller production batches and local manufacturing, as well as changes in values according to local needs and cultures. The issues around resource shortages have also "local" connotations: in the food sector, for instance, over a third of food products are "lost" in the fridge in advanced economies, while almost half are lost in Africa in the production chain going from crop to the table, as processes (gathering, preservation, transport, packaging, distribution) are still in need of improvement in areas where hunger is still a major problem. Issues around the talent shortage are also not straightforward: in Italy, there are chronic complaints about the lack of specialised technicians, but Italian manpower is regarded as the best in the world; equally, businesses complain about the poor quality of the education and training system, while Italian graduates are sought and often work very successfully abroad. In this context, the nurturing of talent is a crucial issue: training and education must be diversified, also to accommodate the increasingly demands for multi-disciplinarity, which is always better developed and acquired on the job. In terms of supply chain, the sector has high barriers to entry, a key factor – thus innovation is simpler, also taking advantage of ICT. The discussion in the automation context addressed also sustainability, and the relationship between the machine market (eminently B2B) and the products market (B2C). Pressure groups and customer awareness and demands increasingly push producers to request guarantee that machines and materials used are sustainable (in both the "green" and social meanings), which involves close cooperation with supply chain actors. This proved to be true also in other sectors, where the supply chains become "alliances" to answer sustainability demands. In the case of the increasingly pharma-oriented med- and biotech industries, there are also regulatory issues connected with sustainability, for instance related to the obligation of conducting animal testing, which are largely frowned upon by customers.

Day 1 | Session 2

Clustering model and IPR management across projects

Moderator

Mr. Franco A. CAVADINI, Synesis

Speakers
Ms. Rosemary GAULT, University of Sheffield
Mr. Mirko BERGADANO, Studio Torta
Mr. Enrico CALLEGATI, CRIT
Ms. Franziska BERGMANN, Steinbeis-Europa-Zentrum
Mr. Frits Feenstra, TNO

Mr. CAVADINI opened the session by thanking speakers and welcoming guests, both from parallel CSAs and other clustering experiences. He introduced the core concepts relative to the clustering model being developed in the context of the EFFECTIVE Action.

Ms. GAULT proceeded to present experiences from the REFORM project, dedicated to composites, which led to the creation of the CLEAN cluster in a FoF context. The experiences highlighted clustering issues regarding: (a) different stages of individual projects along the project lifecycle, (b) unwillingness or legal implications of IP sharing outside the project boundaries, and (c) incompatible application areas of results, as well as (d) difficulty in defining common KPIs for cooperation. IPR management-related matters (also *cf. infra*) and time (both in terms of additional resources to be dedicated to clustering and of project timing) were highlighted as very relevant hindrances to clustering. Motivation to achieve common results was cited as a key driver to support clustering: in this context, the "top-down" approach to clustering adopted by EFFRA (*ex-ante* clustering of FoF projects from the same Call) was seen as largely unviable; common interest and a more bottom-up approach, stemming from sharing goals across projects, aided by a framework providing assistance and support for such activities, was regarded as a more effective solution. Other ideas brought forward towards successful clustering were addressing competences rather than projects, which would also enable reaping the benefits of multi-disciplinarity.

Mr. BERGADANO offered a legal point of view on clustering activities, as a patent attorney. He stated that, normally, he is involved in the last stages of projects' lifecycle. IPR management in projects clusters is, in legal terms, not different from IPR management within projects, as the key issue involves the transfer of knowledge from one entity to another: the basic activity involves determining which part of the foreground is patentable, who are the patent applicants and who are the owners. He advised to make an early assessment of background and to trace foreground, in different steps, alongside the evolution of the project, to limit disagreement on prospective ownership of results. He also advised against shared ownership, which poses risks because of the difference in requirements by different partners, as well as the serious risk of having partners relinquishing from the procedure while still ongoing. In addition, licensing is easier when only a single owner exists. The general advice provided was thus to break down knowledge generated by the project, to assign separate ownership to individual partners: a flexible approach which leads to the creation of several "specialised" IPR rather than a single, catch-all wide patent. Specific issues in the context of clustering is represented by sharing confidential vs. non-confidential information, whose boundaries are often not clearly defined, or which could hinder the clustering processes itself, especially in the early stages.

Points of discussion addressed the start-up process of clustering, with the connected issue of empowering coordinators to start talking among each other without breaching confidentiality clauses. Legally, this was regarded as risky, as partners might find themselves in a position to delegate someone (namely: the coordinator) who could potentially fail to defend their individual interests. From the projects side, a suggestion was the establishment of bilateral agreements between partners with clustering in mind,

although safeguarding background information could be in jeopardy. Legally, it was stated that non-disclosure agreements (NDAs) of sort should be underwritten; also in this context, it was noted how patent applications covering the subject matter protect applicants for 18 months. An objection, and general comment, was the fact that the vast majority of project material is not covered by patents. From the owners' point of view, there were also demands for more clarity upfront on the overall process in terms of costs and time involved. A general lack of knowledge about IPR was also cited as posing issues – also beyond the clustering process. The possibility of an open repository was also ventilated: while suggesting that the EFFRA Innovation Portal could partially cover this activity, the existence of a concrete problem in legal terms preventing effective results sharing and cooperation among projects was acknowledged, as was the need for specific agreements within a dedicated legal framework for cooperation.

Finally, the evolving activites of the other four CSAs were presented by project representatives. Specific questions concentrated on FoFAM, the CSA dedicated to Additive Manufacturing. It was highlighted how the creation of a large "community" was pursued, with connections to the AM Platform but also beyond to industrial actors. To the question of why machinery was excluded from the project, it was highlighted that the four sectors considered were regarded as those most likely to show successful implementation of AM technologies in the short term: the SASAM project Strategic Research Agenda and Roadmap was cited as a good source of additional information in this sense.

Day 2 | Session 3

Framework and network of stakeholders for industrial exploitation of innovative technologies

Moderator

Mr. Wim RENDERS, Brainport Development

Speakers

Mr. Karl Ludwig KLEY, Bilfinger VC
Mr. Stefano PORETTA, ComoNExT
Mr. Enrico CALLEGATI, CRIT

Mr. RENDERS opened the session by thanking speakers and welcoming guests. He illustrated the approach currently followed in devising the Industrial Exploitation Framework (IEF), which is taking shape based on a series of questions to be looked into ahead of the start of the project, or to assess the commercial viability of prospective projects. In the preliminary talks with companies taking part into FoF projects, there was a general agreement on the actual willingness to exploit results: they could benefit from an IEF. In the definition of the questions, a "Jeopardy!" approach has been followed, i.e. starting from the answers. The process foresees iterations of the sequence: implementation of the questionnaires > feedback > replacement/elimination/improvement of questions.

Mr. KLEY presented the point of view of corporate venture capitalists (CVC) in assessing prospective innovation for investment. He illustrated the approach followed by his company, based on an R&D open-minded innovation strategy which favours awareness of disruptive new technologies rather than incremental innovation. Relevant aspects cited included: (a) strategic relevance of the technology, (b) uniqueness of the innovative idea, (c) strong IP position (in case of disruptive technologies, market entry is

usually represented by "who comes first"), (d) scalability (i.e. the perspective of mainstreaming vs. limitation to single niches), (e) the existence of a solid team with "market" competences (sales, finance…), not only R&D, (f) a clear "route-to-market" (i.e. answering the question "whom do I sell the product to?"), (g) the possibility to be financed (i.e. proven scalability, industrial sizing,…), (h) straightforward and easy business case (answering the question "how do we earn money?", avoiding for instance recurring revenues). Two cases were presented to illustrated many of these elements in real life. Potential issues highlighted in this context addressed business continuity and the dichotomy between strategy and finance (i.e. reconciling the need to earn money to pay back investment with strategic interests, while leaving room for development). A whole chapter was dedicated to the delicate relationship with founders, the (previous) owner of the innovation: many experience frustration for the valuation of their company/innovation and often fail to gauge the difference between having 'a small share of a big cake or keeping a large share of a small one', as they have a different approach and underlying motivations. Others have little experience in waterfall analysis and often fail to realise the implications of evaluating shares and distribution of money, and to take into consideration debt which erodes on the overall figure. Many fear losing control over their "creature", which is often a primary motivation for founders: there is a "less-than-50-percent" syndrome, which in fact is not necessary to control a company, as a skilled team is more relevant. Finally, issues exist regarding the (frequent) lack of specialised competences regarding finance, market knowledge or business know-how to run a company, which require careful management.

A lively *Questions&Answers* session followed. Audience enquired about the viability of the CVC model in the current context of low cost of money, and what advantages CVC can provide to founders: in this sense, it was highlighted how the equity route is costly (at least 3x initial investment), how loans require collateral assets and how CVC can offer a valid answer to a "balanced" approach where enough money is collected to survive, but not too much, and risk dilution. Further questions brought up that this specific company never funded EU projects results (but cases in which national funding was involved were considered) and enquired about the use of technology forecasting techniques, to which a more market-centred approach was preferred – even in cases where no market (yet) exists and where market development opportunities can be reaped, starting from adjacent markets. Finally, it was convened that a gap exists between CVC and the research world, and that business angels-type interventions might offer a better deal for founders, especially in the context of start-ups: incubators are geared to cater for them.

Mr. PORETTA presented the case of such incubator: a Science and Technology Park (STP) which offers a physical space for networking, supports startups on the basis of an 'innovativeness' assessment carried out by an *ad-hoc* technical commission, and caters for local businesses. The incubator supports startup activities for three years: a long span of time, yet deemed adequate to guarantee business viability to emerging companies, and provides services and a mix of competences to nurture innovative ideas. The STP has supported three startups stemming from EU projects and, through its activities, attracts between 6 and 8 million EUR of EU funding yearly. A key feature of the STP in question is the presence of a group of engineers available to all companies, fostering networking within the organisation, and its strategic position between Switzerland and the business-rich Milan area.

Mr. CALLEGATI presented a further technology transfer initiative, borne from inter-company cooperation towards innovation and promoted by a group of non-competing businesses with automation needs in the Emilia-Romagna region. The advantage of collaborative innovation allows to maximise effectiveness of financial investments (which alone is likely not to be sufficient), to share innovation-related risks and learn from each other's mistakes, also in consideration that, on average, one in 3,000 ideas makes it to the

market, but that important lessons can be learned from the development process of the unsuccessful ones and that the effort spent on them can be valorised. The organisation conducts internal roadmapping exercises to study technology state of the art and define priorities useful to all participating stakeholders, based on their research needs. The core advantage of such an initiative are the definition of aggregated information, the provision of high added value customised services and the opportunity to build trust amongst stakeholders, so that cross-pollination of ideas and competences is possible across the board, stimulated through the shared initiative. The initiative stemmed from a thorough knowledge of the local industry fabric in order to leverage local competences in a non-competitive and systematic manner. Exchange of knowledge and research are carried out through subscription to the centre's services, according to time invested (the entry fee amounts to EUR 20,000 / year; turnover from fees representing roughly 1/3 of the total).

Questions kicked off the general discussion, addressing first the importance of a competitive edge: for Venture Capitalists, this is crucial – but absolutely needs IP protection, which does not necessarily mean patents –; in the case of the incubator, IP is of course taken into account, but it is not a prerequisite, as incubator services include IPR management support. Some in the floor highlighted the need to pursue a coherent strategic approach to effectively reach the market, which can be very hard; others stressed how the approach to innovation of NewCos and already established companies is very different and that, in any case, both require time. It was noted how often communication and language/"culture" is an issue: when researchers have ideas, these are presented at pitching events, and salespeople would be needed to present ideas in the most business-friendly manner (answering the crucial questions "What is in it for me? How much does it cost?"). The involvement of salespeople, or at least of professionals with market knowledge, was declared as desirable since the onset. In this context, it was highlighted how Horizon2020 applications now require a business case in proposals, an attempt at the definition of an exploitation path. It was also noted, however, how calls for proposals in EU projects are based on technology questions, rather than business ones; equally, such projects tackle progressive, rather than disruptive, innovation, not making them suitable for all market approaches.

Beside success factors, "toxic" factors (i.e. elements that discourage market actors in investing in specific innovative ideas) were discussed. One key element cited is the lack of a team supporting the innovation, i.e. the competences within the companies exploiting these ideas. Other elements mentioned were the lack of a clear business model ("in one sentence: how do you make money?") or the development of niche solutions alone, which do not allow for wide-spread applications. Paradoxically, even the EU flag was considered potentially *toxic*, as technologies stemming from EU-funded collaborative projects are sometimes seen as risky because of the many stakeholders involved (who are aware of the most innovative aspects of developed technologies, hindering safety) and because of the dissemination/promotion obligations, which is seen as reducing the confidentiality of sensitive information. The absence of "storytelling", or lack of either marketable elements or of the new technology's prospective impact on business is also seen as discouraging market uptake: communication, e.g. the format of the information provided, was regarded as key in this context. A final element cited tackled directly a key feature of FoF projects, which typically address TRLs up to 7 or 8. It was suggested that market actors tend to lack interest for solutions under TRL 9, which is beyond what the Commission tends to fund. It was nevertheless noted that partially completed solutions have appeal with private investors, if there is a reasonable prospect of them actually being marketable or adapted to company needs and strategic interests.

Day 2 | Session 4

Presentation of Case Studies

Moderator

Mr. Franco A. CAVADINI, Synesis

Speakers

Ms. Alessandra D'ALESSIO, Synesis

Ms. Franziska BERGMANN, Steinbeis-Europa-Zentrum

Mr. CAVADINI opened the session by thanking speakers and welcoming guests, in stead of Mr. MONTIEL who was unable to attend the session. He introduced the rationale for the case studies, which see four partners in four key regions in Europe tackle four different industry sectors and validating selected aspects of the outputs foreseen within the EFFECTIVE Action. In general terms, the case studies will be looking into existing clusters, involve market stakeholders and cover the gap between EFFECTIVE and the market. They will also look if the existence of a regional network supporting technology transfer and innovation is a determining factor for exploitation, and explore the alternative possibility to draw more general principles towards a "holistic" framework for exploitation, valid at EU level. Finally, he reminded the audience that focus will be on selected FoF projects and project stakeholders, with special attention to SMEs.

Ms. D'ALESSIO and Ms. BERGMANN then proceeded to present the key features of the Italian (Emilia-Romagna, on advanced production systems) and German (Baden-Württemberg, on medical devices) case studies.