This roadmap has been approved by the members of the steering committee for the plan for the digital transition in the building industry of 16 June 2015.
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DIGITAL TECHNOLOGY IN THE BUILDING INDUSTRY, A RESPONSE TO THE CONSTRUCTION STIMULUS PLAN

Innovation in the construction industry, an essential pillar of the construction stimulus plan

The construction sector has been facing recurrent difficulties for several years. Indeed, the building of between 300,000 and 350,000 homes is initiated each year whereas the intended target is around 500,000 new homes per year. To achieve these objectives, the construction sector needs a breakthrough innovation. Innovation is one of the key factors for resolving a difficult situation by providing new answers to real problems while taking account of the state of the sector involved. As such, digital technology has been identified as a breakthrough opportunity to improve the efficiency of the construction, renovation and management/operation/maintenance of buildings... and as an improvement guideline essential to the industry.

Digital technology, the new revolution in the construction industry

Digital technology can improve the effectiveness of those involved in all the steps from design to maintenance, including development, manufacturing of equipment and products, installation, management and servicing, and also improve the quality of projects while significantly affecting the value chain.

While the complementarity of sectors is an established fact, transversality is somewhat less so. However, bringing about the widespread use of digital technology is going to call for the development of a transversal dimension between those involved and the various sectors in order to move towards an effective cooperative mode, where each player plays a role and provides a value building block.

Some stakeholders already use digital technology and are convinced of its added value, while others are suspicious or reluctant, as its usefulness has not been fully demonstrated.

However, as pointed out by the McKinsey report on digital technology of September 2014, “if these technologies were to be fully deployed, they could generate a huge economic value, estimated to be almost 1,000 billion euros in France by 2025. This value would come both from the added value generated by companies and from the “surplus” picked up by consumers”.

It also went on to say that “For all stakeholders, the consolidation of a very large amount of data to be managed simultaneously, with a large number of interfaces, represents a major challenge which can be met by digital technology”.

The main goals of an digital technology in the building

The priority actions of the plan for the digital transition in the building industry involve three areas, given that one of the essential aims stated by the Minister of housing is to allow craft businesses in the building industry to adopt the use of a digital tool on work sites.

If we want to durably transform the building/construction sector and support it in the digital transition, the actions of the plan for the digital transition in the building industry must be credible, useful, and meet the expectations of industry stakeholders: economic benefits, higher productivity, ease of use, quality improvements, decreased claims and data sharing in accordance with individual rights.

These actions are not all-inclusive. They will be tailored and adjusted on the basis of the work carried out by the technical committee, the difficulties encountered and the guidelines decided on by the steering committee.

Transversalities will also need to be established with the PACTE programme. This is an action plan for construction quality and the energy transition (PACTE). It involves supporting the enhancement of the skills and professionalisation of the stakeholders in the building industry. Rising to this challenge represents a pool of skilled jobs that cannot be relocated.

1/ Survey by the McKinsey & Company firm entitled “Speeding up the digital transformation of companies: a source of growth and competitiveness for France” – September 2014
THE POLITICAL WILL TO IMPROVE THE BUILDING INDUSTRY

I - The digital task force in the building industry

Sylvia Pinel, the Minister for Housing, Territorial Equality and Rural Affairs, announced the launching of a digital task force for the building industry on 24 March 2014. On this occasion, she appointed Bertrand Delcambre as the digital Ambassador responsible for bringing this assignment through to a successful conclusion.

The task force’s final report was submitted to the Minister on 2 December 2014, with 4 recommendations:
• convince and inspire all stakeholders and in particular project owners;
• meet the infrastructure and enhancement of digital skills needs of those involved, in particular SOHO/SMEs;
• develop tools tailored to the size of all projects;
• instil confidence in the French digital ecosystem.

This report confirms the need for an ambitious movement to provide digital transition support for the whole building sector.

II - The announcement of three strategic plans for the industry

In this context, Sylvia Pinel announced, at the Council of Ministers meeting of 10 December, 2014, the mobilisation of a portion of the construction insurance risk compensation funds amounting to 70 million euros to support the development and growth of actions to promote renovation and energy efficiency in the interest of decreased claims.

Three priority action plans were decided on:
• an action plan for construction quality and the energy transition (PACTE) with €30 million mobilised;
• a plan for the “digital transition in the building industry” with €20 million mobilised;
• a research and development plan aimed at removing the obstacles specific to asbestos removal with €20 million mobilised.

These actions are intended to involve stakeholders in a spirit of improvement, enhancement of skills and cost reduction in both construction and renovation. On the basis of an assessment of the existing situation, the mobilisation of those involved must be complementary with and speed up the actions engaged, and also provide for innovation in response to the Government’s objectives for the building sector.

The programme for the “Digital transition in the building industry” aims to support and speed up the emergence of digital technology for all stakeholders in the building industry.

III - Implementation of the Plan for the digital transition in the building industry

The Plan for the digital transition in the building industry officially established on 20 January 2015, with the appointment of Bertrand Delcambre as Chairman of the plan for the digital transition in the building industry, has three objectives:
• experiment, capitalise, convince and give people a sense of ownership of digital technology in the daily construction process;
• allow the enhancement of the digital technology skills of building professionals and the development of tools tailored to all work sites by focusing on the mass deployment objectives and giving special attention to the BIM solutions for small projects;
• develop a trusted digital ecosystem by notably encouraging standardisation work to enable the interoperability of tools and software and developing devices leveraging the use of digital technology in projects.
THE ORGANISATION OF THE PLAN FOR THE DIGITAL TRANSITION IN THE BUILDING INDUSTRY

I - Plan governance

1/ THE PLAN CHAIRPERSON
Appointed by the Minister for Housing, Territorial Equality and Rural Affairs, the Plan Chairperson:
- carries out the work required to define the operational programme and its updating;
- implements this operational programme involving all the steering committee members;
- oversees, through his moral authority, the establishing of a consensus in approving the various stages of the plan;
- maintains neutrality to prevent any conflict of interest in implementing the plan and promotes the interest of the building sector.

2/ THE STEERING COMMITTEE
The steering committee breaks down the defined guidelines into an operational programme that it adopts.
The steering committee:
- proposes the procedures for implementing the selected projects;
- enforces the public procurement rules for the selection of service providers;
- monitors the proper financial performance of the plan in response to its operational programme.

It is supported, as and when needed, by the technical committee.

The steering committee includes of a representative of:
- the French environment and energy management agency (ADEME);
- The French construction quality agency (AQC);
- the French association of construction products industries (AIMCC);
- the French confederation of crafts and small businesses in the building industry (CAPEB);
- French national institute of architects (CNOA);
- COPREC, an independent third party;
- the State (ministries responsible for housing, the economy, finances and culture);
- the French property developers federation (FPI);
- the French federation of trades unions for counselling, engineering and digital intellectual service providing sectors (CINOV);
- the French federation of insurance companies (FFSA);
- the French building federation (FFB);
- SYNTÉC engineering;
- the Union des Maisons Françaises (UMF);
- the French national union of quantity surveyors in the construction industry (UNTEC);
- the French national union of architecture trade unions (UNSFA);
- French social union for housing (USH);
- the Nouvelle France Industrielle – roadmap for the “Renovation of the energy efficiency of buildings”;
- Qualified personalities appointed by the Plan Chairman.

3/ THE TECHNICAL COMMITTEE
The technical committee is responsible for producing the technical, legal and financial response to the requirements specified by the steering committee through the operational programme.

Its members and the way it works are defined by the steering committee.
It gives an opinion on and approves the specifications proposed by the technical secretariat and advises the steering committee on the funding applications sent by third-party stakeholders in the “Plan for the digital transition in the building industry” in response to the operational programme.

The technical secretariat acts as the committee secretariat.

II - The technical secretariat

The plan for the digital transition in the building industry is technically supported by a technical secretariat, which coordinates and operationally manages the plan for the plan Chairman, and oversees the technical quality of projects and their compliance with steering committee guidelines. It has no voting rights during steering committee discussions.

As such, it is required to:
- establish, with the technical committee, specifications for each project under the operational programme;
- provide technical expertise on funding applications submitted by third-party stakeholders in response to operational programme guidelines;
- manage the intellectual property of the plan’s contents;
- propose and implement actions to promote and provide communication about the plan in particular through a dedicated website;
- prepare the financial round table discussion in the event of co-financing;
- submit files to the technical committee and to the steering committee for which it provides secretariat services;
- implement and monitor actions taken with beneficiaries in liaison with the plan chairman and authorising officer;
- implement and monitor consultation and approval processes related to deliverables produced;
• report any technical progress made or difficulties encountered to the technical committee and suggest a position to be taken;
• ensure proper compliance with public procurement rules in all expenditure financed or co-financed by the plan for the “Digital transition in the building industry”;
• report on progress to the steering committee;
• prepare accounting and legal orders, prepare expenditure orders, establish the financial account and annual activity report and submit them to the authorising officer for approval via the plan chairman;
• keep a record of the plan expenditure (commitments and amounts paid).

III - The working method

1/ THE ORDER PLACING METHOD
The plan’s actions will call for the budget to be mobilised on the basis of the ordered priorities of the appended roadmap to the exclusion of any subsidy scheme rationale. These priorities are defined to technically and gradually support the industry in the digital transition.

Orders placed by the PTNB come within the area of public procurement. For this purpose, the steering committee will ask the technical secretariat to submit it with a specification for each operation for the launching of the appropriate procedure: invitation to tender, call for expressions of interest, calls for proposals with or without competition according to the case.

The steering committee will propose the appropriate procurement method given the order complexity, desired speed of execution, expertise and cost challenges involved.

2/ THE SETTING UP OF THEMATIC WORKING GROUPS.
Guiding the building industry in the digital age calls for the defining a methodological strategy and an implementation schedule ensuring the fluid, logical and consistent implementation of actions.

The goals set out by the Minister Sylvia Pinel for the concrete, swift digital transition of all sizes of work sites and projects also calls for the identification of prioritised actions and responsive, appropriate methods both for the examination and the implementation of the plan’s projects.

IV - The actions identified as priorities
The plan for the digital transition in the building industry has identified some work as being of priority and essential to the success of the digital transition for stakeholders in the building industry. To this effect, particular attention will be given to the performance of this work up to its completion.

The aforementioned work is as follows:
• BIM for all stakeholders: development of office and work site digital tools for small- and medium-sized structures;
• the housing monitoring and maintenance digital logbook;
• standardisation of processes and exchanges;
• digitising of existing arrangements for the renovation and operation of works;
• the communication actions in support of the work of the plan for the digital transition in the building industry.
GUIDELINE 1

Experiment, capitalise and convince to inspire all stakeholders

The use of the digital model has been prevalent among stakeholders (project management, companies, etc.) for several years. However, its use remains limited and its inclusion in a BIM process is not yet widespread in France (a few dozen projects referenced to date).

As a general rule, it is large rather than small structures that are proficient in and make use of these tools and associated strategies, in large-scale projects, in France and abroad; other uses, on smaller projects, are beginning to be developed but are more difficult to identify as they are less well publicised.

Before being able to bring these practices into widespread use and consider making them mandatory in public procurement, the largest possible number of stakeholders of all types and in particular project owners need to be convinced and inspired.

There is a need to identify and analyse current experience, in order to make good practices in the use of digital tools and the BIM process visible at the various stages of projects.

The analysis of projects must qualitatively and quantitatively highlight on the one hand the required investments and on the other, the gains and benefits for stakeholders in terms of both project productivity (costs, deadlines) and quality.

There is also a need to demonstrate the relevance of the use of digital models and BIM on small projects run by voluntary project owners, especially in the public sphere (social housing agencies, regional councils, local authorities, etc.). The number of projects and experiments underway is relatively low for the time being, and there is a need to increase the movement by coordinating a think tank specific to public and then private project ownership and offer interested stakeholders a project ownership assistance (AMO) device suitable for implementing digital tools and strategies in public construction or renovation projects.

Recommendations and guidelines for project ownership and its partners need to be drawn up based on the initial lessons learned to, on the one hand, demonstrate to public and private project owners and project leaders the compatibility with the current regulatory framework (MOP law, public procurement code, etc.) and with the BIM process cooperative strategy based on the digital model, and on the other part, define the roles, fees and responsibilities of the stakeholders in using the digital model.

In parallel, the State as a project owner could commit to the digitising of its heritage assets, beginning with large-scale works in the short term and in the interest of achieving significant savings so as to make the State act as a role model in supporting a few iconic new construction and renovation operations and in launching an ambitious programme of digitising its stock of public buildings.

Moreover, educational kits will be needed to give the greatest possible number of stakeholders (SOHO/SMEs) an understanding, using suitable language, of the whole point of these tools and what they will mean.

A digital technology in the building industry portal can highlight and make the following accessible to all: good practices, documents explaining concepts and strategies, stakeholder and software references, etc. and contribute to appraising the adoption of these tools through online surveys at regular intervals. Testimonials about digital model projects can be emphasised on the portal for educational purposes.

The plan will help to gather, leverage and draw attention to the first initiatives, monitor them for capitalisation purposes and inform all the stakeholders in the building’s life cycle about cost savings, productivity gains and decreased claims. This action will seek to attract wide interest and will make it possible to inform and involve stakeholders. It is a major challenge for the Plan’s success.
If we manage to inspire stakeholders, two barriers will need to be overcome to bring digital technology into widespread use: skills and equipment (hardware and software).

Working professionals in the building industry have not been trained in the use of these tools. These represent tens of thousands of stakeholders of all types, who need to learn how to use these new tools and this new working methodology: architects, project managers, engineers, technicians, entrepreneurs, craftsmen, etc. and for whom solutions are needed to allow them to assimilate the required know-how under conditions appropriate to small structures.

In parallel, efforts will be needed to make computers and software, appropriate for the use of digital technology, available to all stakeholders. Some options may require hardware and software tools that are powerful enough to handle digital models (3D): the extra investment then required can be estimated to be several thousand euros per workstation (ranging from €8,000 to €15,000 according to CINOV). As this power requirement is above all needed for the most complex design tasks, it will not be required at all levels and the average investment can thus hopefully be limited.

Likewise, the use of digital technology is based on the managing of construction/renovation project related information to underpin the cooperation between stakeholders through the improvement of interfaces (project ownership/project management, project management/contractor, contractor/operator, etc.) throughout the life cycle of projects. The information must thus become shared, reliable and sustainable at the level of the building itself and its nearby environment (infrastructure and networks: fluids, energy, waste, etc.).

Through the bill for energy transition and green growth, the “housing maintenance and monitoring digital logbook” will highlight the importance of information production and shared access, with a view to operating and renovating buildings better.

The initial lessons learned in the use of the digital model and the BIM process have highlighted the need, for each project, and prior to the start of design or construction work, to analyse the flow of information needed for communication between stakeholders for the design and construction process, and to clarify the respective roles of stakeholders and the data models supporting this communication. Such analysis efforts, at each time specific to the project, are beyond the scope of small structures: for modest-sized projects and the deployment of digital technology at all levels, there is a need for “ready for use” tools tailored to the business processes actually used by stakeholders.

Finally, the combination of design data and the data collected during the operating phase opens up new perspectives for optimising renovation operations. It will hopefully be possible to improve the quality of use and decrease the overall cost (work/operation), while improving transparency in the risk of obsolescence and the impact on the asset value.

Indeed, the operator, with access to design data, can take into account the building’s specificities in its management and optimise energy and comfort management. The latest work of the UNEPFI property working group thus show that much information about the sustainability characteristics of buildings is gathered at some point in time in the building’s life cycle for the purposes of building regulations and codes, financial and extra financial reporting exercises, and strategies in obtaining certification, etc. However, this information is rarely kept and reused in technical and especially financial decision-making processes. Most of the information needed to provide an assessment of the sustainability of assets is already available, but its use is held back by the lack of systematised processes shared by the various business sectors. The financial efforts required to establish such systems would be written off through their use in the context of environmental reporting and management. The BIM process would thus become a central tool in the ecological transition in the building industry.
GUIDE 3

Développer un écosystème fiable

Afin de permettre aux acteurs du secteur de l'immobilier de développer l'utilisation du modèle numérique à travers les spécificités de leurs métiers, il sera nécessaire d'assurer les acteurs de la compétence des données échangées, qu'il s'agisse de leur conformité à des normes, de leur fiabilité (traceabilité et niveau de garantie et de marge d'erreur) ou de leur durabilité sur le temps. Ils auront donc besoin:

- de formats stables et neutres pour la description des structures modélisées, adaptés pour l’interopérabilité logicielle et pour le développement d’applications open source;
- d’offrir des modèles numériques avec des informations sur les matériaux, produits et équipements en formats utilisables par tous les fabricants et marchands sur le marché français (environ 7 000 marques);
- d’être en mesure de compter sur des outils et des acteurs dans lesquels ils peuvent avoir confiance;
- d’être en mesure de profiter de données fiables, sûres et durables tout au long de la vie du projet (plus de 50 ans);
- d’être en mesure d’être dotés d’une étiquetage/investigation/certification appropriée ;
- d’être en mesure d’identifier des bonnes pratiques et de les suivre.

La standardisation est déjà bien avancée, mais reste à finaliser pour:

- des formats neutres qui peuvent être utilisés pour créer et utiliser des modèles numériques sur lesquels l’interopérabilité logicielle repose ; l’ISO 16739 standardisation des IFCs doit être complété, réinterprété en législation européenne et promu aux éditeurs de logiciels et à tous les acteurs concernés ;
- les informations sur les produits de construction : un standard expérimental NF XP P07-150 en cours de publication doit être réinterprété en législation internationale et être testé pour permettre le déploiement d’une solution électronique de catalogue adapté aux besoins du secteur.

Le monde de la construction devra se mouvoir avec confiance sur tous ces nouveaux concepts et outils. Il est donc important d’organiser et de soutenir la standardisation (NF, EC et ISO), tant sur les formats de données utilisés pour les modèles numériques que sur les informations sur les matériaux, produits et équipements qui doivent être utilisés. Parallèlement, il y aura un besoin d’évaluer la viabilité et la faisabilité de la mise en place d’un système de signature de confiance adapté aux outils, aux acteurs et aux projets afin de consolider progressivement le développement coopératif du travail. En particulier, il y aura un besoin d’organiser et de soutenir la certification des outils logiciels, pour permettre aux acteurs de tester de manière spécifique ces outils, le déploiement d’IFCs (export et import) et d’accueillir confidemment les investissements des acteurs.
GUIDELINE 1

Experiment, capitalise and convince to inspire all stakeholders

ACTION 1.1 / DIGITAL PORTAL

OBJECTIVES
Convince and inspire all stakeholders:
• by creating a reference platform to construction and building federate stakeholders around digital issues;
• by analysing actual experience and lessons (identification of locks, solutions considered and actually implemented, lessons learned, etc.) beyond the communication exercises often implemented;
• by establishing a corpus of digital and BIM good practices (in particular on medium-sized projects) and sharing it with the whole sector;
• by providing responses to the central question of the impact of BIM and more broadly digital technology on the building’s overall cost, completion deadlines and quality. It will in particular be of interest to compare the gains achieved against the expected gains and breaking them down by type of stakeholder and task.
• by establishing educational content for training in and introduction to BIM and the digital model, based in particular on testimonials and by producing presentation materials suitable for very wide dissemination with SOHO/SMEs (video, animations, etc.).

METHOD
• Analysis of lessons learned in France (operations under public and private project ownership, etc.) and abroad (UK, Nordic countries, US, Singapore, etc.).
• Assessment of the costs of digitising and its impact on the project’s various dimensions (costs, deadlines and quality) including the construction/renovation/operation phases.
• Inclusion of lessons learned in educational form on the “digital portal” for the purpose of capitalising on and leveraging experience.

TIMETABLE
• Launching of the analysis of requirements: March 2015.
• Initial onlining: 30 June 2015
• The portal will then continue to be updated with analysis from other actions, including: project ownership and BIM, leveraging the digital strategy, etc.

ACTION 1.2 / ANALYSIS OF LESSONS LEARNED

OBJECTIVES
• Pool digital advances in France for capitalisation purposes.
• Use those lessons learned to produce a “good practices guide” summarising the pitfalls to be avoided and the means to be used for the BIM and the digital model.
• Identify the sharing of hardware and software resources needed to provide an initiation in and an incentive to use digital technology (Cluster, fablab, etc.).
• Identify good practices based on the building or housing digital logbook.

METHOD
Use the local initiatives network to feed back significant lessons learned for dissemination (on the digital portal for example).

TIMETABLE
• Launching of the working group in April 2015.
• Selection of projects as a result of the responses to calls for proposals in May and June 2015.
• Analysis of the selected projects from July 2015 onwards with an appropriate methodology.
• Follow up and updating for portal purposes.

ACTION 1.3 / PROJECT OWNERSHIP AND BIM

OBJECTIVES
• Inform and support the MOA in its strategy to include the use of digital technology in invitations to tender. This makes it possible to use the public and then private project ownership to create ripple effect on the whole of sector.
• Monitor pilot operations and create references.
• Define the level of compatibility with the current regulatory framework (MOP law, public procurement code, etc.) with the use of digital technology and BIM in particular.
• Draw up a contractual digital deployment plan (reference specification, ad hoc articles, etc.).

METHOD
• Setting up a section of experts to provide assistance and support of pilot drivers under public and then private MOA as well as the establishing of recommendations and appropriate guidelines.
• Coordination of an interministerial working group, including specialised public authorities and local authorities.

TIMETABLE
• Setting up of the section: from April 2015 then followed by pilot operations.
ACTION 1.4 / NATIONAL NETWORK OF LOCAL INITIATIVES

OBJECTIVES
- Encourage, support and promote regional initiatives to pool equipment, tools and services.
- Support BIM operations with pilot municipalities, for new construction, renovation and operation.
- Exploration and promotion of financial support schemes for equipment and training: CIR, PIA, dedicated investment fund, etc.

METHOD
- Directing and coordination of the RNIL with representatives of regional initiatives and the sector’s professional organisations to pool experience.
- Support and promotion of the development of regional initiatives to pool resources intended for SOHO/SMEs (equipment, coaching, initial projects, etc.).

TIMETABLE
- Launching of the working group and ramp-up: from May 2015.
- Network in place and communicating (in particular through the digital portal): from September 2015 onwards.

ACTION 1.5 / LEVERAGING THE DIGITAL STRATEGY

OBJECTIVES
- Leverage stakeholders with recognised expertise on the basis of initial experience, for the benefit of the project owner and the project manager, through appropriate trusted signs.
- Distinguish projects having successfully used digital tools to serve as examples to be followed and create a form of emulation through a national competition organised each year.

METHOD
- Organise the annual nationwide competition of the most successful projects in the use of digital technology.
- Install appropriate trusted stakeholder signs allowing project owners to call on teams with recognised or identified skills.

TIMETABLE
- Organisation of a national competition: each year in September and from September 2015 onwards.

ACTION 1.6 / ANALYSIS OF THE CONDITIONS FOR BRINGING THE DIGITAL MODEL INTO WIDESPREAD USE

OBJECTIVES
- On completion on an initial phase of analysis of current experience, draw up an action plan aiming to gradually bring the digital model into widespread use, with representatives of professional organisations.

METHOD
- Consolidate and capitalise on the lessons learned in the field to deploy local actions with companies, so as to provide stakeholders with simple, easy to use ownership tools.

TIMETABLE
- Launching on completion of the initial lessons learned of action 1.2 relating to the analysis of lessons learned.

GUIDELINE 2
Support the enhancement of the skills of professionals and stimulate the development of tools tailored to small projects

ACTION 2.1 / INITIAL AND ON-GOING TRAINING

OBJECTIVES
- Support the deployment of digital technology in the building industry by enhancing the skills of business professionals through on-going training and prepare a new generation of convinced stakeholders through appropriate initial training.

METHOD
- Popularisation of the BIM process and development of educational content suitable for all stakeholders.
- Identification of training needs through an ad hoc working group.
- Identify and qualify existing on-going training, and then leverage it to achieve the expected mass deployment objectives through online training sessions (MOOC, etc.) and the provision of BIM training repositories.
- On-going training curriculum.
- Formalise agreements for the initiation in the use of digital tools, in national education, higher education and architectural schools.
**ACTION 2.2 / IDENTIFICATION AND DEPLOYMENT OF DIGITAL TOOLS FOR THE STAKEHOLDERS OF THE BUILDING/CONSTRUCTION SECTOR (BIM KITS)**

**OBJECTIVES**
- Inform professionals in the building industry of the potential of digital technologies (3D printer, connected objects, etc.) and their applications on the work site.
- On the basis of specifications tailored to the needs of SOHO/SMEs and in particular craftsmen in the building industry, this involves developing “ready to use” solutions (BIM kits) including digital model creation/management tools, based on libraries of typical works, for modest-sized construction/renovation projects and basic applications (techniques, surveys, estimations, etc.).

**METHOD**
- State of the art and communication, via the digital portal, about these technologies and application examples.
- Develop and freely provide OpenSource digital model handling tools (viewer, SDK, auditors, etc.). These OpenSource developments will supplement the developments carried out by the major stakeholders in information technology.
- Develop “in the cloud” libraries of BIM objects allowing SOHO/SMEs to use the BIM on a less intensive basis as a service (BIMaaS) through tablets and entry-level machines without needing to install specific licenses. For this purpose, a French sovereign cloud will be preferred.

**TIMETABLE**
- Developments of kits: from March 2016.
• draw up a specification for the development or improvement of tools to meet the growing needs of users;
• monitor exemplary projects to analyse them and encourage stakeholders to make the digital transition for the renovation of existing works or the management of heritage assets.

TIMETABLE
• Launching of the working group: April 2015.
• Survey of existing works: June – September 2015.
• Iconic operations: from April 2016.

ACTION 2.5 / PREPARATION FOR IMPLEMENTING THE HOUSING MONITORING AND MAINTENANCE DIGITAL LOGBOOK

OBJECTIVES
• This involves assessing the technical feasibility of the various digital logbook scenarios given the regulatory framework for the monitoring and maintenance digital logbook provisions specified in the energy transition law.

METHOD
• Gathering of expectations and “mapping” of the possibilities provided by BIM.

TIMETABLE
• Launching of recommendations: 2nd half of 2015.

ACTION 2.6 / APPLICATIONS FOR THE CONSERVATION OF PUBLIC HERITAGE

OBJECTIVES
• Highlight the advantage of the digital model for the conservation of heritage assets:
  – demonstrate the relevance of the strategy on a few iconic operations (trials);
  – develop appropriate guidelines and recommendations for the archiving of operations and the traceability of work carried out on public heritage buildings.

METHOD
• Identify public heritage maintenance operations to initiate a strategy for digitising existing works and deploy during the test phase the initial tools identified and recognised as relevant as a result of the work on digitising existing works (action 2.4).

TIMETABLE
• Launch: 1st half of 2017.

ACTION 2.7 / DIGITAL TOOLS IN SUPPORT OF THE ENERGY TRANSITION

OBJECTIVES
• Develop digital tools in support of the energy transition including:
  – layout drawings of digital projects;
  – digital self-checking tools for companies;
  – digital tools for requirement specification and sizing;
  – digital tools for the treatment of pathologies;
  – …

METHOD
• These tools will be developed in support of the PACTE programme.

TIMETABLE
• Launching surveys: 1st half of 2015.
• Launch: 2nd half of 2015.

GUIDELINE 3

Develop a trusted digital ecosystem

ACTION 3.1 / SUPPORT FOR IFC STANDARDISATION: LIFE CYCLE, STANDARDISATION AND INTEROPERABILITY

OBJECTIVES
• Ensure software sustainability and interoperability through neutral, open and stable data formats for the description of digital model works.
• Leverage French know-how in the definition of standards.

METHOD
• With stakeholders, coordinate the definition of the positioning strategy as part of standardisation with a view to meeting the objective of widespread use of BIM at a reasonable cost.

TIMETABLE
• Launching of the working group: April 2015.
ACTION 3.2 / TRIALS WITH PP BIM AND BIM OBJECT LIBRARIES

OBJECTIVES
- Make sure that the data relating to construction materials and products are available in the most standardised formats possible and compatible with the various stages of projects; the digital model must thus be able to be populated, first generically and then more specifically with the characteristics of construction materials and products so as to reproduce the complexity of construction realities.
- The plan will seek to support actions involving the challenges of mass deployment, in particular as regards SOHO/SMEs, needed to promote the widespread use of these libraries, excluding any strategy intended to prefer a specific stakeholder in the industrial sector.

METHOD
- Trials based on the NF XP P07-150 experimental standard for dictionaries of construction product properties.
- Establish generic libraries of BIM objects representing construction solutions (DTU BIMé) in liaison with action 2.2 and PACTE.
- The action will make sure to make a proper distinction between action involving collective benefit and action that may involve the competitive industrial sector.

TIMETABLE
- Launching of trials: creation of the reception structure and the steering committee in April 2015.
- Establishing of the PPBIM dictionary: setting up of the board of experts, development of the software and web platform, initial loading and development of services related to dictionaries for platform self-financing from September 2015 onwards.
- Following up of standardisation work; porting of the work at European level (CEN and European Commission) and trials with other European dictionaries (networking) from March 2016 onwards.
- E-catalogues: setting up by companies of the first data catalogues from June 2016 onwards in partnership with Promodul (energy renovation plan NFI).

ACTION 3.3 / REQUIREMENTS SUPERVISOR

OBJECTIVES
- Examine the feasibility of new ways of stating technical/regulatory requirements, allowing automatic queries through a digital model.

METHOD
- A call for expressions of interest will be launched to capitalise on existing strategies. Following this, a call for proposals could be launched to support the development of this requirements supervisor. Trials in a well-defined area and then widespread use.

TIMETABLE
- Trials: June 2017 – September 2017.

ACTION 3.4 / DIGITAL LAW

OBJECTIVES
- Identify any legal issues that will inevitably arise in connection with the deployment of digital technology and examine response possibilities.

METHOD
- Coordination of a working group in connection with the following topics: project ownership and BIM, digitising of processes, digital DCE, DOE/digital DIUO.

TIMETABLE
- Launching of the working group: September 2015.
- Recommendations: June 2016.

ACTION 3.5 / ANALYSIS OF THE DESIRABILITY OF A TRUSTED OPERATOR

OBJECTIVES
- Examine the desirability of establishing a trusted operator for digital technology in the building industry, bringing together the interested stakeholders, whose role will be to provide an information qualification service to initiate trust and act as a catalyst in the development of digital technology.

METHOD
- Consultation with representatives of the stakeholders in the sector concerned to achieve a consensus.

TIMETABLE
## PLAN TRANSITION NUMÉRIQUE DANS LE BÂTIMENT

### GUIDELINE 1

- **1.1** Digital portal
- **1.2** Analysis of lessons learned
- **1.3** Project ownership and BIM
- **1.4** National network of local initiatives
- **1.5** Leveraging the digital strategy
- **1.6** Analysis of conditions for bringing the digital model into widespread use

### GUIDELINE 2

- **2.1** Initial and on-going training
- **2.2** Identification and deployment of digital tools for the stakeholders of the building/construction sector (BIM kits)
- **2.3** Digitising of processes for the building/construction sector (BIM, digital PC, DCE, DOE/DIUO, etc.)
- **2.4** Digitising of existing works
- **2.5** Inclusion of BIM in the maintenance and monitoring digital logbook
- **2.6** Applications for the conservation of public heritage
- **2.7** Digital tools in support of the digital transition

### GUIDELINE 3

- **3.1** Support for digitalisation, life cycle standardisation and interoperability
- **3.2** Trials with PP BIM and object libraries
- **3.3** Requirements supervisor
- **3.4** Digital law
- **3.5** Analysis of the desirability of a trusted operator
OUTLOOK

Bringing the building sector into the digital age calls for an ability to look to the future and consider future prospects in a national, European and international economic environment.

Today, 82%⁴ of business leaders consider digital technology to be a potential vector for innovation and competitiveness.

According to projections³:
• 9 billion objects will be connected worldwide by 2018;
• 60% of servers will be virtualised within the next 2 years;
• the European mobile applications sector could contribute up to €63 billion to the EU economy by 2018.

As Sylvia Pinel, the Minister for Housing, Territorial Equality and Rural Affairs, said in a press statement on 25 March 2015 “The plan for the digital transition in the building industry seeks to bring the sector into the digital age as an essential condition for building more, better and cheaper”.

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² IDC, Les Echos, Xerfi, BI Intelligence, CRN, University of Massachusetts Dartmouth, Mashable, Business Insider, Mobile Marketer, Forrester, Internet Retailer, The Economist, AllThingsD
³ IDC, Les Echos, Xerfi, BI Intelligence, CRN, University of Massachusetts Dartmouth, Mashable, Business Insider, Mobile Marketer, Forrester, Internet Retailer, The Economist, AllThingsD
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