MOOK: The Knowledge Management Method Applied to a Gen IV Project, The Continuation of a Successful Story
Dr. Gilles Rodriguez, CEA, France

Berta Oates
Welcome everyone to the NEXT Gen IV International Forum webinar presentation.

Today's presentation is on MOOK: The Knowledge Management Method Applied to a Gen IV Project. The Continuation of a Successful Story.

Doing the introduction today is Dr. Patricia Paviet. Particia is the Chair of the Gen IV International Forum Education and Training Working Group. She is also the National Technical Director of the Molten Salt Reactor Program for the Department of Energy in the United States, under the Office of Nuclear Energy.

Patricia Paviet
Thank you, Berta. Thank you very much. Good morning everyone. Good evening. It's a pleasure to have Gilles Rodriguez from the Commissariat à l'énergie atomique et aux énergies alternatives, at CEA, France with us today.

I have the pleasure also to interact with Gilles on a monthly basis because he is serving on the Gen IV International Forum, Education and Training Working Group and he served as the Technical Director of GIF from May 2019 until December 2021.

Gilles is a senior expert engineer at the CEA/CADARACHE center. He is a project manager on GEN IV collaborations and international affairs since January 2022.

He graduated from the University of Lyon in France in Chemical Engineering in 1990. He received a Master of Science in Process Engineering in 1991 from Toulouse.

He joined CADARACHE in support of Phénix and SUPERPHENIX operation in 1991 and RAPSODIE decommissioning. In 2004, he moved to Japan to work on the Monju reactor. And then until 2008, he worked on the coupling of Gen IV VHGR with Hydrogen Production Process.

From 2008 to 2013, he was project leader of sodium technology and components. He joined the ASTRID project until 2019, first as

responsible of the Nuclear Island, then as a Deputy Head of the ASTRID project team.

During his career, Gilles contributed to over 120 scientific publications that are dedicated to GEN IV systems; hydrogen production; coolant performances; and technico-economy.

Since 2018 he is also involved in Knowledge Capitalization innovative methods, winning in 2021 two awards for innovative Knowledge Management technique development and promotion.

So without any delay, I am going to give you the floor. Gilles, I would like to thank you very much for volunteering to present this webinar. Thank you, Gilles.

Gilles Rodriguez
Thank you very much, Patricia. I hope everybody can hear me clearly. So yes, I will present you tools that I've developed for knowledge management, which is called MOOK. So, because in the audience not all people are aware of knowledge management, I would like to make a brief recall of what is knowledge management. A short recap of the ASTRID project at CEA, where we created and invited this MOOK tool in fact.

Just an explanation of making knowledge management on the ASTRID project, what was the process, and how we do knowledge management on ASTRID and after the ASTRID project, what I call the beginning of the successful story. And I will try to explain, review the plans for the future in my presentation. What I would like to share with you is that knowledge management is something which is very important. That could be fun. And all the recommendation and explanation I will deliver to you is free. You can apply it in all of your project or business. So, this is my main objective. Not the description of the ASTRID project, but the description of the tool and the knowledge management approach. But of course, I have to come back before other context, of course.

So very briefly, because we could spend hours and hours to say what is knowledge management, I will take you two definitions. One, which is very conventional, which is knowledge management is a process by which an enterprise gathers, organizes, shares and analyzes its knowledge in a way that is easily accessible to employees. The last words are very important. They need to be easily accessible to employees. This knowledge includes technical resource, frequently asked questions, training documents, and people skills. So, this is one. You can find some other definition, but this one, I am quite satisfied with this one. And I've found another one more pragmatic.

I didn't find, in fact I created it. Its knowledge capitalization is dedicating a fragment of your time today to fight against the dangers that the erosion of your knowledge could cause tomorrow. And this is the first definition I would like to have. So, there is in this definition a question of time, time passing, killing a little bit and eroding your knowledge. But I add another supplement to say it must be done collectively with method and including a large proportion of agility and a big toolbox. There is not one unique method to make knowledge management, but there is multiple way to access and to make this knowledge in comparison to the context that you will have to encounter. This is something very important.

So why I have the feeling, and a lot of persons are sharing my feelings, that knowledge management is very important now, especially in the nuclear field. For different explanations, I would like to share with you with these two following slides. First of all, the nuclear renaissance we are living in many countries will need a significant increase of manpower and young generation. We are talking in front of about 100,000 new persons that should join the nuclear field in the coming years in order to be able to fulfill all the nuclear renaissance we would like to have in France. 100,000 people is not few people, and so you need to have management of the knowledge transfer in order to be efficient and to save time.

But one question arose, how can we guarantee that this new generation will gain the most and the best from the olders, and from the huge experience already gained from Gen IV reactors or by extensions from nuclear reactors? This is very important. We have the feeling that they will have in the following years a sort of camel with two humps: one from the young generation, another one from the old generation. But these two humps have to be in interaction and deep interaction, otherwise we will lose knowledge from the transfer from the older to the younger generation. So, how can we use methods that can be attractive, innovative, efficient and of course, time savings. Because as I told you all, the knowledge management is also a question of time. And time is running very fast of course. How can we apply these knowledge management methods to all persons, experts, technicians, scientists, have a project, have a program, and with all the Gen IV systems, this is the challenge. And, once again, how to convince people that knowledge is the most valuable treasure that they could gain.

I would like to share with you a small drawing. Sometimes I have this feeling, people are saying, I'm rushing, I'm rushing, I have to make a startup, I am rushing. But they have not taken time to make the experience and to exchange with the olders. And of course, now I have to be considered as one of the older. So sometimes my feeling

is I am proposing solution, but people say, no thanks, we are too busy. But they are losing, in fact, a big treasure that I can propose to them. It's just my personal feelings of course.

Some other explanation I would like to share with you. Our society and our companies are quickly changing. And it is not in a way to simplify the knowledge preservation and transmission. We can explain this furthermore, due to COVID. Before COVID, the cheapest efficient KM tool was a coffee machine to exchange with your colleagues. Since coffee, now we are most of them working or teleworking a lot of time, and the natural transfer of knowledge around the coffee machine is strongly decreasing.

So, in fact, you have to find some other solution. And when I have a personal feeling, when I am in telework, I am in this situation. But in this situation, I am not very worrying about how I can transfer all the knowledge I am gaining, to my colleagues. Because I do not see them. And even if I exchange with them virtually, it is not such efficient as a face-to-face meeting. Before COVID, you may rely on all experts who get everything in their brain, their office, or their computer. But since COVID there is a Big Quit phenomenon that happened in US, but also in all western countries. We encountered this Big Quit phenomenon. So how can you guarantee that one person will stay more than 20 years in the same company, doing the same job, and so keeping his personal knowledge, as a treasure. You cannot. It's impossible. In one week's time, he can change his mood, change his job, and you're losing his brain and his knowledge of course, if you have not prepared the knowledge transfer. So, this is a target that we have to identify as a real issue regarding our companies. Moreover, in the nuclear field, the projects are lasting more than a life. You have 5-8 years for the design, 10 years construction, 40 to 60 years operation, and 10 years decommissioning. And sometimes when you work on the decommissioning of a nuclear reactor, you need to know what was the early design. So, it means that who has this knowledge? Where it is? In which document I have to efficiently go quickly to see what I really need, when I am making a decommissioning, or when I am making an operation. This is the particular effect of knowledge management in the nuclear field, because the projects are long, very long, or extremely long. Moreover, SMR at Small Modular Reactors and Advanced Modular Reactors are all based on a series effect. But what if there is a big gap between two reactors construction? What about the supply chain? If you have 5 years delay or 6 years delayed for the building and operating one SMR to the other one, how do you manage to keep your knowledge, or to keep your person aware and keep them inside your company? It's very difficult. So, you have to apply a knowledge management process here also.

And one thing also, I would like to share with you but we will talk a lot about artificial intelligence. I am hearing a lot of times artificial intelligence will all save us from our ignorance. Maybe. I don't know. We will see in the future. But keep in mind that AI is only funding its intelligence on the data that you put inside. So, if you provide poor knowledge inside, AI will provide you poor answers. Be aware of this. He is not the exact answers, he's just extracting the best of what you provided. But if you provide nothing, you will extract almost nothing as well.

So, my feeling, or my recommendation will be that when you have a knowledge management-based company, it's a paradigm shift, and you have to move from one animal to another one animal. So, the thing will be to move from the squirrel attitude, who want to preserve all his knowledge, all his notes, and to hide them; to a meerkat attitude, where you have a better feeling of the living community and where you share together the good times, the dangers. And there is every time one person minimum who is in alert about the knowledge that could be lost.

So, in fact, you have to move this KM paradigm shift from the left column. I know. Knowledge is mine. I will not go far to all of them. New knowledge competes with my personal knowledge, to something which is much more dedicated in a group or in a community. We know. Not I know, we know. Knowledge is not mine. Knowledge is ours. Share knowledge helps me. Admitting I don't know is the first step to learning. This is a change of mood that we need to have. And I am sure that in all your company, I hope you have some meerkats, but you can encounter also a lot of squirrels in your company.

And so, this is the challenge is to move from the squirrel to the meerkats attitude in every company in order to have a natural feeling of knowledge management from all the person living in a company. It's not thinking about I, it's thinking about we, because the company is a group, is not a sum of individual persons.

So, I will just make you a short recap of the ASTRID project at CEA. It will be very short. I've already done a webinar on the ASTRID, so I will not repeat it. Just to show you in a nutshell, ASTRID project. So, it started from 2010 until 2019. The purpose was to design an SFR reactor with the past SFR reactor knowledge but injecting inside a lot of innovations. And it was dedicated to electricity production and innovations to enhance safety and performances. And it has been a little bit abruptly stopped in 2019 at its basic design phase. And so, we decided in 2018 that we have to shift to an ambitious

knowledge process in order to be able to keep and to reuse for the future all this knowledge for the future projects that could happen in around the 2030s. So, there was a very level of delay and gap time between the end of the project and the beginning of a new project. So, this is a roadmap we developed. Just to say that, I will not go in detail, but it was just to highlight you that the roadmap shows that it was not a linear history. So, in fact, there were a lot of things that we changed during time. We changed. We made a new ASTRID design to cost process, where we reduce the power of the reactor. So, we started with ASTRID 600 electrical megawatts, and we moved to ASTRID 150 electrical megawatt. And if you do not know history, you are completely lost. And so, we provide about 25,000 documents. But if you are not putting these documents back into the context, you are lost. Completely lost. So, it's a reason why we decided at the end, during one full year, to make an ASTRID capitalization project, in order for the future generation to be much more – to dive much more easily in the ASTRID project and inside the relevant document that they would like to have among the 25,000 documents. At that time, I have to recall you, we were not talking a lot about artificial intelligence.

So, what was the process of making a knowledge management? We had several objectives. The starting idea was the following. We wanted to apply the knowledge management process to highlight the value of the actors; the actors or the person belonging to the ASTRID team. It was very important for us to recognize the gain done by human people. And we wanted also to keep them engaged until the end of the project. So, we had the basic idea to say, knowledge management will not be a constraint. It must be fun, very important. So, we will not ask them to write another document, another deliverable. We have to find some other solutions. Let's have the support of knowledge management experts to get advice all along this adventure, because we were inventing a new method. We were not knowledge management experts, but we wanted to have the advice from some experts. We have, as I told you, to insist on the project and studies contextualization. Very important. Otherwise, you will be completely lost in the document. And while talking about ASTRID 600, sometimes talking about ASTRID 150, the steam generators, and after there was a gas cooler, heat exchangers, everything was very complex if you have not the history on the roadmap of this project. And so, one proposal, the first one we had, was to say, let's use the video as a tool to simplify knowledge capitalization and transmission. Because video is fun. You can see the people that were acting during the project. And it was a new way to try to make knowledge transfer. So, I would like to spend a small time, a little time on the two figures on this slide. If I am talking by analogy, when you are in a project, it's a little bit as a car. When you

are running very fast, your viewing angle is shrinking. And so, the same in the project. When you are in a rush, when you are very late, you are shrinking your viewing angle. And so, you will not talk about the context, the history, the background, etcetera. We will just go and focus to the results, the results, the results.

But when after you have to make the knowledge management, you are not very aware of who will learn or read this document. And so, you have to reopen your viewing angles and what that seems to you obvious your tacit knowledge, you have to re express it completely in order to be able to ensure correct transmission of your knowledge.

So why using video recording for knowledge management? We wanted some innovative tools and not asking the ASTRID team only to write their testament. It was really not the objective. Otherwise, we will be sure that there will be some big no about writing their testament. We wanted to apply knowledge management process to highlight the value of the persons who were working on the ASTRID, what I am calling the actors of the ASTRID project. And so, in a video recording, there are some putting some valuable footprints image and voice. Young generations are no longer reading books. Tell me, it's true. They are watching videos. They are on YouTube. So, we wanted to have, or to try a little bit to use the same tools as they are using today. And not our old tools that are document deliverables and testament.

We have taken the best interesting feedback, open course on YouTube. The GIF webinars also was very inspiring for us, and there were precursors for this kind of MOOKs that we have developed. And I have to deeply thank Patricia for this, because one of the basic ideas was when I started to make one webinar, in fact. And moreover, sometimes it's better to make a free talk than to extract the tacit knowledge, instead of doing just write what you know, what you say. Because tacit knowledge is coming here under this kind of iceberg, and it's moving outside much more easier when you make a free talk. When you write, which you try be much more focused on what you have to write and the tacit knowledge is not going very fluently by this way.

So, we decided to make some MOOK. So, you will see that MOOK will be a video recording of knowledge. So MOOK was for Management Organized Online Knowledge. Management, because we have to organize information, we have to make some knowledge capitalization, and also knowhow capitalization, which is much more difficult. But by video, sometimes you can see a person and make a movie about what he's doing. And we have to make a methodology for the organization of the information. Organize, because it has to

be understandable by a technical identified audience. It's not a clip video, it will not be on YouTube, it's interactive videos, but it is for the person who have to know what they have to know. So, it's a high-level content in fact. Online, because it will be on electronic support. It will be, yes, online, but with a restricted access. And in fact, during the definition and where we store these MOOKs, we take into account the intellectual properties defined during the project. So, it will not be on YouTube and it will not be open to all the persons. So, it's a big difference between a MOOK with a 'K' on knowledge and the MOOCs that you can see with a 'C' that you can upload, for instance, on YouTube. And so, the K for knowledge is I know today, thus I am the owner today of a knowledge and I will be in a video. And so, he or she will know what I knew. So, the video is the first KM connection. The written document and deliverables will be some links to go deeper in the knowledge. So, it's the first attempt in order to make the knowledge transfer. It's not the ultimate one, but it is the first connection for knowledge transmission.

So, in fact, a MOOK can be made in five steps. The first steps you have to realize a selection of the materials that you need. So, it will be jointly by all the actors and you will see. So, you will choose in which subject you select to have a MOOK, in which subject you select to have an interview. And in each one you have a synthesis report. Then you have to prepare your PowerPoint presentation. So, it's not done. You have a framework in order to make for your PowerPoint presentation that you are obliged to respect. So, every expert has to prepare this format. The backbone of the future MOOK will be the presentation, the slides, but he has also to define the second slide, 'Meet the Expert' with a picture of him, a detailed table of content for the third slide. Then you will have the technical presentation, obligatory, mandatory, lesson learned, and recommendation for at least one slide, but several is there is much more to say. And a list of recommended documentation. And in that case, of course, the person who has seen the future MOOK will be able, if necessary, to dive in the recommended documentation that will be recommended by the expert.

So, the step three will be to record your video presentation. It will be in one shot, but it can be in two manners. Either you can do it with your computer, because PowerPoint Microsoft software allows to make your own video recording. Other, we can do it also in a dedicated small video lab. I will show you after some figures. Then we are doing the video cleaning and chaptering. Because it is done in one shot, a person can hesitate, can take a break. And so, we remove all this time, these durations, just to have something done efficiently. And we are doing after the chaptering, so we, we can move from one chapter to another chapter very easily. And it is not

necessary to follow all the MOOK if what you want to know is on the three last slides, for instance.

Step number five, implement the video inside the database and realize a trace link that with all the recommended documentation and deliverables. So, all the documentation, we limit them to 10 to 20 documents maximum are recommended by the experts. And so, at the end, you have a link that will drive you directly to the documents that you require. So, this is a way as we safely store the video and make the link from the video recording, the MOOK, and the documentation. Because of course, at the end, of course you will be obliged to read for sure. But at the beginning, don't give to the young people about 1000 document or things like this. He will get lost and disgusted. So, we start with a video. Then, if he's interested, he can dive in the different relevant documents.

So, I wanted to show you different important steps. Step one, selection of the knowledge action. So, you have here the product breakdown system. And so, we decided from each box whether it was important to have an interview. Generally speaking, the interview was dedicated for the high level, where there was some strategic decision that has to be taken. And it was easier for people to say, strategically, I have to take that decision compared to write it. It's much more difficult to write that there was some difficult situation that you have to take when you are talking about strategy, it's not like technique.

We decided sometimes that it was necessary to have some videos, because there was a lot of innovation, and sometimes there was also a lot of important things that we have to store. And sometimes, because there was a lack of deliverables, we decided also to make some document. So, in fact, it's a combination of all these strategies that we did during one full year for all the team of the ASTRID project.

Just to show you for the step number three, the recording. As I told you, it's done in one shot. You have here one of my colleagues, his name is Edward. He is recording himself on his presentation. So, he will make a MOOK here. Just here we are very light materials. These materials can be moved from one office to another office. It's not so heavy. It's only four big bags. It can be done in a room, in an empty room, but in an office, for instance. And you can move it from one research center to another place. And the price is maximum now, maximum €15,000. So, $15,000 for a good video recorder, for the spotlight, for the control panel and a very efficient system.

On the step number four. So, this is GIF of the system. You can see the chaptering. So, when you move the mouse on the top here, you

can see that on the left you will have the content of the presentation. And so, by this way, if you click on one chapter, you will directly move to this chapter and not follow all. So, if you have the content and if you want to see only the number three, you connect to number three or number two and you go. And you do not have to follow all the video. Because the length of this video is a little bit like a webinar, is between 50 minutes to 1-1/2 hour. Some of them are 2 hours. So, it's too long to follow in one shot. So, in that case you can directly go where you want. The chaptering is very important. Otherwise, as I told you, the easily access for the employees of this knowledge is not done. If you are not making any chaptering, you are lost. You have done good job, but nobody will follow your videos.

So, this is something which is very important to have this. And so, as a result, we have made about 130 videos from 1 hour to 1-1/2 hour. You can see that that was done by different systems. On the top left it was done from our own office. Here it was done by the video recording. Some of them were done by interviews and some of them on the bottom left were done a little bit like the weather forecast, with some other materials that was belonging to Framatome company.

So you can see that there was a lot of diversity. But in all case they were all respecting the same rules that I explained to you on the step number two, to prepare their PowerPoint and to make the chaptering afterwards.

So how can I talk about the initiative feedback of this knowledge management? Very good, successful system. In less than one year we are able to define our own knowledge management methodology that were assessed by the French experts. We have produced more than 100 MOOKs plus about 20 interviews. It were all realized by CEA actors, but also by partners from the different companies, Framatome, Bayer [ph] and some other companies.

These MOOKs are all interconnected inside the ASTRID database according to the project product breakdown structure. So, when you arrive now in the ASTRID database, you are not coming and just searching what you want to know by keywords. First, you watch video, then you connect two very interesting documents which are as the last slide of your PowerPoint presentation. So, in fact you are not connecting to 25,000 documents. You can of course. But you are first connected to 2000, very highly rated and recommended by experts document. And this is a big difference. In fact, you reduce the number of documents you need to investigate because this one are four- or five-stars document compared to the 25,000 others.

The easy to do MOOK tool appeared to be one of the most convenient way to allow experts to transmit their knowledge. It is simpler and less complicated than writing academic knowledge capitalization synthesis report. Of course, some people say, I don't want to make this kind of situation, I'm too stressed. I don't want to see my face on a video recording. I prefer to write. In that case, we say, okay, go on, you can write. If you want to make some document, there is no obligations to make MOOKs. But in more than 95% of the case, all the persons prefer to make video instead of writing. So, they found it much more useful and much more easier. In one word, it's 'fun.'

And for young generation, we have the feeling that it is a smart approach and it is much more fun and efficient to watch and to start watching video than being lost in an electronic library with some keywords for the documentation search. And even if the artificial intelligence will come to place now, I don't think that it will compete to this video, because these videos are high standards. And I will explain you after how I can manage to work at the same time with artificial intelligence and this MOOK videos.

So, the beginning of the successful stories was here. From 2018 to 2019, we start this process of management. We will create 100 videos. It was quite a challenge because we started from nil, and within one year we make 100 videos. And as I told you, all the team have played the game with enthusiasm. They were proud to appear their person, their face, their voice, to appear in this heritage. It was something that was very relevant for them. And it was a sort of honor to be there to say, I will transmit my knowledge by this way. And we confirmed the first trials from 2020 to 2023. We communicate with bottom experience. We made conference publication articles, we create a knowledge management network inside and outside CEA. And by this way, we were able to have a big connection and have contact with some person to say, hey, Gilles, I've heard that you make a sort of MOOK system. Can you tell me, because I have some knowledge management difficulties in my office, in my lab, can you explain me how I can manage to do with your MOOK system? And so, we try from time to time to explain, to show, and to provide our advice. And they are doing the game. They are reproducing what we have done. So, it seems for us that this tool is quite easy to handle. We want it to be recognized for this effort. It's not just to win the prize. We won two prizes, the SFEN prize from the Societe Francaise d'Energie Nucleaire. And an award also from the Knowledge Management Initiative at the World Nuclear Exhibition. The way to win this prize is not only to win this prize, but after to be able to communicate and to be able to extend our network about this

tool for all the persons who would like to know better or more about this MOOK tool.

We extend this initiative to other CEA domains. And we wanted to make a bottom-up to top-down systems. So, if I am describing what we have done on ASTRID, this is this piling of stones. It works. Sometimes we didn't really know how it works, what was the equilibrium, but anyway, it works. And so when you move to a top-down strategy, it has to be much more structured. You need to have some fundamentals. And so, this is why you need to have a bottom-up initiative. You pass it to the top level. And after, you transform a first try to a sort of processes and a top-down strategy, which will be much more robust and extended to all labs or to a wide organization.

And of course, this is what I am doing also. We continue to explain, disseminate, convince about the key roles of knowledge management and operate knowledge management action also. I am not alone. We have done it with a lot of persons. And I would like to say hello to Philippe and to [Unclear] who helped me a lot, and to all the team from ASTRID who helped me a lot in making this presentation and make this successful story.

So, when the ASTRID and, as I told you, we wanted to make after this initiative to try to disseminate these tools to some other part at CEA. And this is different successful story that we had. For instance, we made here a debriefing session at the CEA for the young generation. The young generation come to the olders. On the right you have here two persons that work on the ASTRID team. And they say, I would like to have a small meeting with you in order to exchange. And we say no, first you watch the video, then we will meet you and you will see that the level of content of our exchange will be of higher level. And this is what we did. So, this meeting was done after for the young generation, having seen different MOOKs and after they asked very clever and efficient questions relating to what they wanted to know.

We are making also a lot of recording of the retired person. And at any time that we contact retired person, as you can see here, when you contact them, you say I need to have your knowledge. Can you write? They say no, now I am retired, I don't want to write anything. But when you say, we are making a small video, are you okay? You just come. You explain freely what you want to explain about your knowledge. So, we make this in the morning and after we have a good lunch at the restaurant. What happens? They all say yes. And this is how we can have the feeling to be able to come back. The old persons, the retired people that are on their way, very proud also to

appear on the video recording. And you can see that the materials here is only on my mobile phone and it works also perfectly. We were also able to record CEA technicians close to requirement, who wanted to explain how he is operating his facility. So of course, you have a book to know how to operate your facility. But when you are asking some questions, he said no, but it's written like this on the book. But I am not doing it like this because it's too boring or not efficient. And by let letting him talk, it's much more efficient that try to make them right. So, this is all the different systems that we could have and we are still following now.

We have a large communication of this initiative and no, winning a prize for us is not an end. It's really a starting time.

Plans and lessons learned for the future. First, I would like to come on this sentence. The events that open out new horizons. And this is the case. We won in 2020, the award. And in fact, it opens the horizons. It opens our network in the knowledge management field and also in the nuclear field where the knowledge management is so important. So, what I would like to say for you for the lesson learned. One and very important, the first one. Be convinced that knowledge management is saving time and money. Then, disseminate this message to your company to convince your staff, you will need their sponsorships so you need to have money in order to make knowledge management and time. Two, adopt the meerkat attitude. Then find your tribe, a tribe to create your community and of practice. And this community of practice you have to do it inside your company and also outside your company where you will learn a lot about the knowledge management tool. I just explained here one tool. But be convinced that there is so many tools to make knowledge management.

Communicate on any success stories and good practice to increase the visibility of your actions and to recall that they are valuable actions. You are making daily efforts to save the time and money of your company and they have to be aware of it. Four, KM is a wonderful framework for innovation. And the new path I intend to investigate for CEA is to interconnect artificial intelligence with all the MOOKs in order to be able for the artificial intelligence to connect 100 MOOKs and be able to select the best parts of the MOOKs if I ask for keywords.

I would like also to create a serious game on knowledge management. The name is knowledge management gamechangers. And so, I will be able in 2024 to show you this serious game. And I am thinking also to create knowledge management in podcasts because it will be very efficient for person to listen during public transportation. Last

but not least, and very important also, trust to your knowledge management network. You need to have a network. Knowledge management, it is a collective effort. And be aware that alone you may go faster, but together we will go further. And it is very important because it's a question of time, so sometimes you need to go fast. But it is also a question of duration and so it's a reason why you need to have a network. And not only doing everything alone, you will lose your time, you will lose your efficiency if you want to do everything alone. So think about having a network and to work collectively.

This is roughly what I wanted to explain to you. I hope you enjoy my presentation. Of course, I am open and we move now for the questions. It was a pleasure for me. I am letting you read this sentence from Albert Einstein, that is explaining exactly what is the transmission of knowledge. And I think we have time now for some questions.

Berta Oates
Thank you, Gilles. I'll let you rest your voice. Get a sip of water. While questions are coming in, we'll take a look at the upcoming webinar presentations. In December, Characterization of U233 for Thorium Fuel Cycle Safeguards will be presented by Ms. Madeline Lockhart. Madeline is the winner of the 'Pitch your Research' competition through ANS. So, we look forward to hearing from her.

In January, Revolutionizing Nuclear Engineering Education: Developing Virtual Labs for Neutron Detection, Geiger Counter and Reactor Experiments will be presented. In February, Analysis of the reactivity loss of the phoenix core cycles for the experimental validation of the Darwin FR code package.

A couple of questions that have come in. The first is why use a database rather than a learning management system to house the information?

Gilles Rodriguez
So, in fact, the database was a requirement by the project. So, when we started to work in quality assurance of the ASTRID project, what was required at the beginning was a system of database. And now the feedback would say we would have to make the knowledge management online and to dedicate a part of the time to do it online, and not at the very end as we did for the ASTRID project. But it was not in the quality assurance process to realize this knowledge management online. And it's a little bit disappointing, but this is the situation. This is why I am trying now to convince all the person to avoid, to reproduce this situation. And I wanted to say that you have

to dedicate a part, a little part of your time to make, at the same time that you have a database, a knowledge management process online.

Berta Oates
Thank you. Okay, Gilles, you have some people to convince still. If a project is so valuable, why not just finish it instead of preparing a massive library of knowledge management for grandchildren, hoping that they will finish it.

Gilles Rodriguez
Okay. There is some political decision to say that they wanted to stop this project and after to say that it will be restarted in 2030 or 2050. But I am not sure that in 2030 or in 2050, all the experts will be here to re-explain all the things. And the library, I'm not very convinced about the library for the future. So, the thing was to say we wanted to have something much more efficient. And in some case also for the people who will leave this project to be proud of what they have done. So, it was a sort of win-win situation. I was obliged, in fact, to disseminate all the team in different organizations, because the team has disappeared. But I wanted to do it proudly and to be proud from them of what they have done, and at the same time to say that we are making an efficient tool for the future. And such a library, I don't think you will have such a win-win situation.

Berta Oates
Thank you. What are the possible benefits of connecting with AI in your database? Please share your vision and expectations with AI usage.

Gilles Rodriguez
So, yes, what I would like to do, in fact, I don't know if it is innovative or not. In fact, when you have a video, you can make a speech to text system. So, I can transform all my video to text. But this text, when you make a speech to text systems, if I am talking about steam generator, for instance, at the time about t-0 plus 10 minutes, on the speech to text you can recognize that you have written or said steam generator at t-0 plus 10 minutes. So, in that case, for me, the artificial intelligence would be able to collect all the speech to text to detect where we are talking about steam generators in all the 100 videos and to be able after to make a reconnection and to make a sort of clip video only dedicated to steam generators, for instance. This is what I would like to do by connecting videos with artificial intelligence. But it's not all tests, it's just some ideas in my mind and I don't know if it works or not. I have maybe to develop a Ph.D. to do this.

Berta Oates

Thank you. If there are more questions, go ahead and feel free to type them into the chat pod while if people have other thoughts. My question for you, Gilles is what steps are you taking to be sure that your MOOK system is preserved technologically in the future? We used to have little floppy disks on computers where we archived information and then we moved to different styles of storage. So are you taking backup precautions as well.

Gilles Rodriguez
So, in fact, we are recording and we are making – we record on two libraries, one which is officially preserved by the national library and another one which is preserved by CEA. So, this is the first steps. In fact, we have not stored everything in one place, but in two places. And for the second one, it is the duty of the national library in order to preserve all the electronic document and to guarantee that we will have at the end all the materials to read this video. These videos are of course electronic videos. They are mp3 or mp4 videos. The tool mp3 and mp4 are existing for more than 20 years now. So, there is no big evolution of this tool. And this is a way we hope we will be able to keep and to share this knowledge for a long time. But you are absolutely true, Berta, it is a worry. And at any time that you are making this, you have a worry to say maybe you will not be able to retrieve what you have done in one due time.

For instance, to keep the trace links from the video to the document is something which is much more difficult to preserve. So, you have the possibility to store everything and to make certain folders of the video plus the different documents that has been recommended by the experts. So the document should be in a PDF file, PDF preserved file. But sometimes we feel to lose the trace link between the video and the document.

Berta Oates
Thank you. How big was the team working on MOOKs and the database and for how long?

Gilles Rodriguez
So in fact, it was a collective work. We did it in 1 year, roughly in 1-1/2 year. We designed some people to say, you are the expert of this subject, you need to make your MOOK. So, in most of cases, I told you they accept and they say, before making your MOOK, we have a sort of group of person, of experts. He had to present his presentation. We have to evaluate if his presentation was exactly on the process we recommend. So the titles, the possibility to make the chaptering, the recommendation at the end, all the document. If it was accepted, we said after now you are in position that you are able to record your video. You take meeting time for making your

video. And after, he was able, the expert, to see afterwards what was the video and to make some little correction if necessary, with the video makers. I forgot to tell you that for the chaptering we were using a tool that is easily used by all the YouTubers. The name of the tool is Camtasia and this tool is price is €350, so $350, not more.

So, you do not need to have a lot of experience and a lot of materials to do this, because it's very now democratic to have a video and to make your own videos for all the person. And if you do not know, please ask to your children, they will explain you how to do.

Berta Oates
Thank you.

Gilles Rodriguez
So, I should add also some person were a little bit shy to start to make videos, but after five or ten minutes it goes perfectly. And another thing also, when you make a video, you are concentrated a lot. So, we recommend to make – some person has to make six or seven videos, for instance, but we say not more than one video per day. Two is too much, you will be tired and you will lose efficiency. So, it was one to maximum two recording videos per day. So, 1 hour to 3 hours maximum as a video recording. But after, you have to relax because it's a lot of concentration, I can tell you. And moreover, sometimes, as I did, you lose your voice. And what happened is you have to make a break.

Berta Oates
Yes. Do you have guidance, suggestions on practical application? For example, how to set up the lighting in the room? Did you use extra microphones? Do you use those little fuzzy things to help diminish any kind of wind sounds, that kind of thing?

Gilles Rodriguez
The major recommendation we had is whatever the video materials you have, what is very important is to have a good recording of the voice. Otherwise, if the recording of the voice is very poor, the person will follow 3-5 of the video and after he will skip. So they say, if you want to invest a lot, please invest in microphones, not in the video. Of course, video should be of good quality, but do not forget the microphone.

Berta Oates
Thank you. I don't see any more questions coming in, so I'm going to take this minute to thank you again one more time Gilles, for your expertise in sharing your knowledge with us. It's been a pleasure

working with you. You are a delight and generous with your time and we appreciate that. Patricia, do you have any closing thoughts?

Patricia Paviet
Yes. Again, thank you so much, Gilles, for volunteering to give this webinar. This is a very important subject, knowledge management. So again, thank you very much for presenting and showing what CEA is doing. That's it for me, Berta, so I wish you a very good day, Gilles and Berta, and everyone else, so a good night.

Gilles Rodriguez
Thank you. It was really my pleasure to present you and it was a feedback I wanted to do, Patricia. Because starting of your webinars was the very first idea to make my MOOKs, so it was necessary to meet you the feedback. Thank you.

Patricia Paviet
Yeah. Thank you very much. And we have an initiative with the education and training working group also to look at knowledge management, knowledge preservation. So, your webinar today is coming just right on time. So, thank you very much, Gilles.

Gilles Rodriguez
Thank you. Have a nice day for everybody or a nice night. Thanks a lot. Bye-bye.

Berta Oates
Thank you. Bye-bye.

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