

Technological Resources and Innovation seminar

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THALES' INNOVATIVE BUSINESS INCUBATOR

by

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Overview

Thales has a considerable R&D potential. Its R&D department employs 25,000 people out of a total workforce of 68,000 employees. However, the varied nature of its activities, arranged into six divisions and divided equally between civil and military operations, runs the risk of producing a 'silo effect' (whereby there is a lack of communication and objectives between related management systems in the same organisation) which is not very favourable to disruptive innovations. Thales' innovative projects' incubator, known as the Emerging Business Initiative (or EBI), was created four years ago. It has a very fast turn-around time of 48 hours during which projects are reviewed, approved and can get started. These projects have an innovative character ; are aimed at markets which show prospects of rapid growth ; have teams which are multitalented and have expertise in numerous areas of interest ; and are compatible with the group's activities. The EBI scheme involves a small number of people (20 teams chosen from 50), but nevertheless has helped to change the culture of the group and has highlighted the fact that innovation involves risk-taking and knowing how to manage potential failure.

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TALK : Marko Erman

I am the director of research and technology in one of Thales' six divisions, Land and Joint Systems¹. Prior to this, I worked in strategy and R&D in various companies including Philips and Alcatel.

The Thales group

Thales' turnover in 2007 was 12.3 billion Euros which should increase in 2008. It employs 68,000 people, 25,000 of whom work in R&D. The R&D budget is nearly 3 billion Euros, and the group owns 15,000 patents. Thales is present in 120 countries, and has industrial activities in 50 of these. Our clients demand that we bring them a very strong added value in all areas, which is why we have integration centres and even production centres in a number of countries.

The group is composed of six large divisions which reflect Thales' different markets. The Aerospace division is in charge of the manufacture of aeroplane cockpits, power electronics, assistance systems, and so on. The Space division is essentially dedicated to satellites. Three divisions correspond to defence activities which now only represent half the group's turnover. These divisions are Aerospace, Air Systems, Naval Systems and Land & Joint Systems. Joint Systems is a term which can be interpreted in both senses, that of co-operation between the three areas (air, land and sea), and that of the alliance between several nations. In both cases, there are problems related to the creation of a network communication and information system as well as an 'inter-operability' system. Security Solutions and Services is the sixth division and deals primarily with the security of large infrastructures such as airport platforms, railway surveillance, simulation for aeroplanes and ships, and the security of information systems.

The Land and Joint Systems division

The Land and Joint Systems division employs 13,000 people in about fifty sites which exist in 20 countries. R&D is a very important aspect in this sector and employs 4,500 people.

The range of products which this division has to offer is extremely large. For example, we produce all the communications systems for the three armies, with radio systems at frequencies ranging from a few kilohertz to several tens of gigahertz.

We also specialise in networks, either networks at the base of infrastructures such as those at France Télécom to which we add equipment which enable us to make them safe and provide various functions, or networks which we install and operate entirely by ourselves, like in Afghanistan for NATO.

As far as our optronic activities are concerned, we make products intended for the civil market as well as periscopes and cameras which can be fixed to the undercarriages of fighter aircraft to take pictures in real time at very high resolution. Our company, Thales Angénieux, makes high quality zoom cameras which have been used for some Hollywood blockbusters such as the Harry Potter films.

The department of land-based equipment makes vehicles for transporting troops which are currently being used by several European countries in Afghanistan ; mobile electronic systems intended for navigation and vehicle management ; and also communication and interface systems between the sensors of different platforms of the vehicle and the command centre of the military operation. Currently, electronics may account for up to 50 % of the overall value in military vehicles, and in several of our contracts in Europe, the interface with

¹ Marko Erman a été nommé depuis directeur de la recherche et de la technologie du groupe Thales (NDLR).

the client is no longer ensured by the platform manufacturer but the system integrator : the manufacturer provides the platform, and our business is to sell the vehicle with high added value.

Our final activity is land systems called “force protection” where the aim is to protect convoys and camps as well keeping the peace in urban theatres of operations because of co-ordination between the drones, command centres, forces deployed on the ground, and so on.

The variety of both our products and solutions increases the possibility of a silo effect. How should one make the most of this variety and turn it into a mechanism for growth ? This question is crucial to our thinking about innovation.

The challenges of innovation

Innovation consists of bringing a new idea to the market either in the form of an incremental innovation or a disruptive innovation.

In the first case, the market is ‘marked out on the walls of the company’, in other words it corresponds to Thales’ internal organisation, culture, and history. The vision of the market and processes to reach this market is clear. The aim is to improve competitiveness, to make larger margins, to advance faster and to offer good products at the right time. In this model, described by the English phrase ‘how to do things better’, the company concentrates on the tools of development and the Lean Six Sigma methodology (to improve the manufacturing process and eliminate defects causing customer dissatisfaction), and calls for a bottom-up approach.

In the second case, namely disruptive innovation, one must do the opposite and ‘break down the walls of the company’ as otherwise, the opportunities might not be visible. The challenge now is ‘how to do better things’. In this case, a little top-down approach is often necessary to create a new vision, impose transversalities (links between hierarchies) and build a new business culture.

Imagine, make, share, reward

The innovation cycle includes four important stages. The first is creativity : one must think up or devise a new product. Secondly, one has to make it : how does one make an idea which shatters the status quo possible ? The third stage is sharing : since all the ideas and initiatives have been woven into a network, a change in culture can be established. The last stage is to reward those involved in the innovation and to thank them so that the process can continue. At each of these stages, Thales has established procedures or tools which I shall now explain.

Imagine

A Magritte painting entitled ‘Clairvoyance’ shows a painter in front of his easel. His face is turned towards an egg, the object he is trying to paint, but on the canvass, the painting which he has already almost finished is of a bird flying off. The challenge of creativity is how one can see the bird from just an egg.

When talking about creativity, discussion often becomes heated quite quickly because every time someone suggests something, someone else replies ‘I’ve already tried that idea, it doesn’t work at all and in any case, it’s too expensive.’ To achieve a positive result, in other words, to produce constructive ideas, it is generally necessary to make the process more structured.

We use methods which are now well-known such as Edward de Bono’s ‘six hats’ method. The hats correspond to six ways of handling any situation, depending on whether one gives priority to facts, emotions, criticism, emphasis on the advantages, creativity, or hindsight. In general, during a discussion, each person adopts a different attitude which in turn produces a

sort of Brownian motion which does not produce a result. Edward de Bono's method involves harmonising people's thoughts and views. Over a given period of time, everyone concentrates on the facts, then everyone criticises them, then everyone uses hindsight, and so on. The succession of the different phases enables one to advance as a group in a very constructive way.

We also use other methods such as the 'mastermind group method developed by the ICMC (Institut cybernétique de management de la créativité : cybernetic institute of creativity management). This consists of creating a collective, group skill based on the individual talents of the participants who have been identified, for example, as 'creators', 'followers', 'finishers', and so on.

Make

For the second phase, making, we have introduced a tool which I would like to stress as it is original. It is an incubator intended to investigate new markets. The term 'incubator' should not be taken in the usual sense because it is not a case here of spin-offs.

Initial observations

Because of our area of activity and our clients, we have to work with relatively long time-scales. As far as strategy, business or technique is concerned, we establish ten-year plans, and devise three-year financial plans. A new project which is launched follows a very rigorous process and if the project is not sufficiently ready or seems a bit risky, the decision is sometimes very difficult to take. We have an amazing wealth of talent, technology, knowledge and views which unfortunately are organised in silos and cannot always be co-ordinated naturally unless they are in projects, imposed by the management, which incorporate bridges between the different areas.

The principle

We created the 'Emerging Business Initiative' (EBI) in response to this dual difficulty. The EBI is very creative in itself, compared to usual procedures in our group.

We ask project managers to present their idea in a document, following six criteria which I will outline later. Subsequently, the project leaders have thirty minutes to explain their project to the assessment committee of which I am the president, and which is made up of managers in the division including the director of strategy, the sales director, the European region director, and three of the eight business line directors of the division. After a debriefing lasting ten minutes, each committee member fills out an assessment form. I make a summary of all the forms and inform them of this during the day. The next day, the project leaders receive a reply – positive or negative – explaining our decision, with qualitative recommendations. In some cases, the committee may wish to ask them further questions in which case a second meeting is organised.

If the project is abandoned, it is not too much of a disappointment because, just like at the dentist's, everything happens very quickly. If the project is accepted, it is monitored every three months by the same committee, which means there is a great deal of transparency. This system has existed for three or four years and has enabled the launch of about twenty projects.

The criteria

We have identified six assessment criteria.

The projects which are presented must show significant prospects for growth. We do not ask for a very detailed business plan but an idea of the potential development prospects. If the investment is 300,000 Euros and the market is worth 2 or 3 million Euros, this project is not very attractive. We want ambitious projects which fire the imagination.

Naturally, the projects have to be innovative but this alone is not enough. They also have to be presented by multi-talented teams which have experience in many fields. For example, an engineer should be in a team with a sales person, or even a line manager, and in some cases a lawyer. We want both to make sure that a unit cannot benefit from the system to try to get additional budgets for 'traditional' projects, and also to avoid the drawbacks of the successive projects. Before one develops an EBI, one has to know how one is going to sell it, or how one to prepare a marketing brochure before knowing how the product will be manufactured.

Finally, even if the aim of these criteria is to compensate for the deficiencies of the model for normal functioning, projects have to remain consistent with the business and technical strategy of the group.

The financial mechanism

The budget of an EBI varies between 100,000 and 500,000 Euros, which enables one to finance a small team for 6 to 18 months.

Initially, we had envisaged paying each unit which took part in an EBI project from funds in the corporate division. However, this would not have been easy because this method would have required each division to be taxed, and since the legal entities cross national boundaries, this posed fiscal problems. It would have made something very complicated out of something very simple.

So we chose something else. We decided to give the managers of the units taking part in the EBI project a spending limit. The expenditure is covered by the unit, but it is not included in the result which serves as a base to assess the performance of the unit and its management.

Some examples

Here are a few examples of projects which have been given the EBI stamp.

The first draws on our experience in optoelectronic balls. These are instruments which integrate a gyroscope, a stabilisation system and infrared and visible cameras which are fixed onto helicopters or any other support platform. The managers behind this project observed that ships of the Merchant Navy have to be equipped with radar but the radar is not always adequate to prevent collisions, because it is not very efficient in the last few hundred metres and this tends to be the zone in which collisions take place. This is why the rules will soon change and it will be necessary to use optical surveillance coupled with radar. Leisure yachts exist as another market. No rules apply here, but the owners of these yachts are often fond of new technologies especially if they take the form of objects which have an attractive design. We have developed a simple and less costly product than that which we manufactured for the Defence Ministry, with a pleasant design which we subcontracted. This product was successfully presented at boat shows in association with other equipment manufacturers.

A second example is the cyclotron which is used in the medical field. We have been working on projected energy weapons for a long time. This is a very long-term prospective approach in which our clients' interest fluctuates. We hope to keep our abilities in this area at a high level and to do so, to find an immediate opportunity in the market. Hospitals, which use radioactivity to make diagnostics, wanted to use isotopes with a very short lifespan (one hour or even half-an-hour) so that patients do not remain radioactive for several days. To achieve this, hospitals had to be given the means of making a radioactive isotope on site using small cyclotrons (2 or 3 m³). We have already sold six such cyclotrons to hospitals in France.

We have also worked on the problem of safety on runways. On take-off, aeroplane reactors produce downward air movements. If an aeroplane enters this vortex on landing, the aeroplane may get damaged. Therefore, one has to allow time to elapse between take-off and landing of aeroplanes on runways, a delay which varies depending on the size of the aeroplane. However, every minute spent waiting means a loss in turnover for the airport infrastructure. To reduce this wait time further, one must be able to detect the air vortices.

However, traditional radar cannot do so. We have studied a lidar (Light Detection and Ranging) with bi-frequency lasers to do this.

The last example is closer to the core of our profession. In most recent conflicts, combat forces or terrorists have tended to blend in with the civilian population, and this may lead to problems of identification and ultimately a risk of death by friendly fire. We have perfected an original system based on a combination of radios with cameras and GPS instruments. When a soldier aims for a target with his infrared camera, the word 'friend' or 'enemy' appears on the screen and helps him to avoid any mistakes.

Experience feedback

Since the launch of the EBIs four years ago, more than 50 projects have been presented and 20 of them have been given the EBI stamp. Our teams have greatly appreciated being liberated from the stranglehold of very long delays to which they were subjected before. When a project emerges, sometimes it takes a year to know whether it will be accepted or not. With the EBI system, it only takes 48 hours. Furthermore, the fact that links between hierarchies and the various disciplines are imposed enable very innovative ideas to emerge which are directed towards a precise market straightaway.

Of the 20 projects which were accepted, some have produced very positive results in financial terms, ten, twenty or even fifty times better than their initial investment. Others have not been successful and have been abandoned. They have all helped to change the culture of the company. People now agree that risks have to be taken in order to innovate, and that one must know how to manage potential failures.

Going further

We hope to go further and to add an additional top-down stimulation with the launch of an in-house competition on topics that we consider to be strategic. The winning project will be given the EBI stamp. We are also going to open up the possibility of allowing more EBI projects to develop when they appear to be a little too unusual by comparison with the normal projects of the group's profession.

Share

Sharing innovations can take place both in-house and externally in the form of partnerships.

The TechnoDay

We have created an in-house event called TechnoDay which aims to help teams from different laboratories, working on related subjects, to get to know each other better. It also shows people from marketing, business development, operations or from any other areas, the technologies which we have so that they may think of new market opportunities in the future.

In 2008, TechnoDay included 60 exhibitors who had come from 20 different countries and attracted 1,000 visitors. In the light of this success, we decided to expand this event to our clients, and 180 of them came from 15 countries.

The partnerships

It may seem surprising that a group which has an R&D potential as important as that of Thales needs partnerships but despite this potential, we cannot do everything ourselves. Our strategy does not necessarily consist of developing all the technologies but helps to ensure that we have access to these technologies. This implies a strong collaboration with all our R&D 'ecosystem', in other words, universities, the CNRS (Centre national de la recherche scientifique : French national centre for scientific research) companies, SMEs, and large

manufacturing firms both on a national or international level. This is why we are very involved in research centres especially System@tic and Cap Digital, and European initiatives (IST, FP6, MEDEA, ITEA), both in the civil and Defence sector.

We also have many partnerships with SMEs. Thales signed the SME Pact. The members of this pact agree to buy a set percentage of sales from SMEs. For most of the signatories of this pact, this percentage is 20 % ; for Thales, it is 30 %. The disadvantage of purchasing policies the aim of which is to stabilise and give security to suppliers, is that they result in reducing the number of suppliers which is slightly contradictory given that the objective is to harness innovation. Therefore, we decided to initiate various ideas which were related to innovation not only of group projects suitable for research centres, but also theme-days aimed at SMEs where we show them products which we predict will have a future and where they can demonstrate their technological savoir-faire which may interest us.

In 2008, for example, we organised a day entitled RadioTech. The Comité Richelieu helped us to identify about 50 SMEs which were experts in radio, some of whom we knew well, others which we did not. We explained our vision of the radios of the future, and each SME made a short presentation. Those who wanted to, were able to continue their discussions. We managed to draw up a list of about 10 SMEs with which we are going to create a joint R&D project, or, for those who already have a product, with which we can advance faster. We can also help them set up a PEA (Programmes d'études amont : study programme) for the DGA (Direction générale de l'Armement : part of the French MoD in charge of advanced studies).

For the SMEs, it is very important to take part in large-scale Defence PEAs which can open up the export market. However, these PEAs are both too long and too rapid for the SMEs. They are too long because a PEA generally needs two or three years of preparation with the DGA and a SME cannot stay 'in limbo' for such a long period of time. They are too rapid because when the programme starts, it has to be operational immediately because a consortium has already been formed, making use of people who have been trained and, in accordance with the code of public works contract, be capable of taking on contractual commitments. We help SMEs to consider their options carefully, and to prepare themselves during the waiting period so that they are operational when the programme starts. We carry out the same sort of procedure in the treatment of images and information, optoelectronics, and making sense of our findings.

Reward

The last stage of innovation consists of knowing how to reward the initiatives. We have several types of reward for the different entities, but the most prestigious are the Thales Awards, given out by the CEO, Denis Ranque himself, at a ceremony where innovation is explained and teams are motivated.

The brain and the parachute

The changes for which we are aiming cannot be limited to actions which produce an incremental improvement, even if every transformation begins in this way. Our aim is a real cultural change, but this comes up against visible and invisible barriers in the structure. If we want these barriers to fall, everyone has to rally round and this is the reason why we do not have a department of innovation: innovation involves everyone including the financial director and the operations director.

However, this effort to rally round can take different forms. For example, some divisions have created a device called 'Innovation Quest' which is a sort of competition to come up with ideas. Others have allowed employees a period of time during which they can handle their personal affairs during work time. The sums invested in these operations are lower than those in EBIs, but the spirit is the same. It draws its inspiration from Albert Einstein's phrase 'the brain is like a parachute : it works better when it is open.'

DISCUSSION

Spin-offs

Question : *You intimated that your incubator was not intended to create spin-offs. How and by whom are the projects you mention undertaken ?*

Marko Erman : The EBIs allow us to bring the projects to a certain degree of maturity so that one can see the market prospects clearly and the forecasts for the return on investment are convincing. At that moment, one of the business lines becomes the leader but the others continue to take part. If one envisages outsourcing the project, the business lines should no longer be interested but this has not yet happened.

No capital risk fund

Q. : *Do you have a capital risk fund to integrate external technologies ?*

M. E. : We had one and we were a minority share-holder, but today it is no longer a fund purely for Thales. Let Erich Spitz explain it to you because he knows the system well.

Erich Spitz : Most of the companies, like Thales, have noticed that ultimately the presence of a capital risk fund within the group was quite difficult to manage. The problem is the reason for investing in a company : is it for technological or financial reasons ? Arbitration is very difficult. Today, Thales now prefers to finance from external funds and to monitor technology via their shares.

Collaborations between the divisions

Q. : *Is there a way to launch projects in the group which lie between civil and military ? In the past, this was what the 'Department for new areas' at Thales did.*

M. E. : There are already various forms of 'bridges' between the different divisions, sometimes with specific structures. For example, we have just created a business line involving civil and defence security which operates for two divisions : there has to be a continuum even if the degrees of security are not the same between the two entities. We have even created a business line which is common to three divisions in the area of protection of convoys, which requires the co-ordination of helicopters, drones, forces on the ground and detectors. Because of the financial mechanism which we have put in place for the EBI system, we could also envisage generalising it for the whole group which would also allow us to launch projects between divisions. Two such projects which we have accepted are examples of this.

E. S. : There is also a central laboratory intended to help very long-term projects with a very uncertain outcome, and also projects which call for talents from different divisions.

M. E. : It is true that research, which is ranked 3 or 4 out of 9 on the TRL (Technology Readiness Level) scale, takes place in the Thales laboratories in Palaiseau, as well as in the Netherlands, the UK and Singapore. It is then a question of co-ordinating the transverse dimension of the various approaches. The transverse part which corresponds to the initial research is then vouched for by the central laboratory. For the other aspects, we have identified five KTD (Key Technology Domains), in other words, technological domains of common interest to the entire group (for example, software for crucial missions) for which we are going to create common governance.

Top-down and bottom-up

Q. : *How do the top-down and bottom-up approaches work in the development of the EBIs ?*

M. E. : The four projects which I have described were the idea of one person on each occasion. The researchers in question talked to me about it and I explained to them that in order to make EBI projects, other people had to be involved. Depending on the cases, they either managed by themselves or asked me to help them. Recently, regarding a project about acoustic detectors, I put a researcher in touch with excellent teams working in the UK and Germany.

Q. : *Had the emergence of these ideas been prepared by prospective initial marketing work ?*

M. E. : No, because the purpose of this operation is to help new market prospects emerge, which we have not considered before. However, we are now thinking of adding a dose of 'top-down' in competitions to encourage projects in areas which we think are strategic. We are also going to strengthen our strategic analysis because we have realised that in the last few years our group's growth has taken place in sectors and markets which we had not foreseen. For a long time, we were able to programme our order book three years in advance, and to predict our projects over a ten or even thirty year period. This period is over because in this area, as in others, needs change very quickly. We must try to understand clients' needs even before the first market signals appear.

The career of 'intrapreneurs'

Q. : *How do you manage the career of 'intrapreneurs' once their project has been accepted as an EBI ?*

M. E. : A project which has been accepted is handled by its original business unit. The project manager then naturally benefits from a career progression. This rule has not been formalised but it goes without saying. Thales has a career management system which enables it to offer the same advantages to experts and managers. It includes 12 grades with a 'Y' shaped structure from grade 9 which corresponds to the distinction between experts and managers. As is often the case, promotion for managers is a function of the number of people they supervise. On the other hand, experts' careers are based on recognition by their peers outside Thales : we hope that our researchers are well known beyond the narrow confines of the company. Their appointment and promotion are entrusted to joint committees which include members from the technical services and the Human Resources department for grades 9 and 10, and for the group committee for grades 11 and 12, with representatives of the division.

We are very meticulous and make sure that the advantages linked to the promotions are rigorously the same for the managers and the experts who have the same grade. These include a company car with the same engine capacity, the same percentage commission, and invitations to professional meetings. One should not forget that the concept of expert is not only a feature of the R&D department, but there are also experts in the Human Resources department and in the legal department, even if the assessment process in these departments is not as formal as it is in the technical sectors.

Management of disorder

Q. : *Once a project has been given the EBI label, is the project manager relieved of his usual tasks or does he have to be in charge of his project and do his normal job as well ?*

M. E. : His position ought to give him some time to look after his project either on a full or part-time basis, depending on the case.

Q. : *What is the impact on the job structure of the project manager at the launch of an EBI ?*

M. E. : Sometimes the project manager may feel torn between his loyalty to his superior and the EBI. We try to manage as best we can, but it may slow down the fulfilment of the EBI. The in-house charter of the rights and obligations of the experts states that an expert has the right to spend 10 to 20 % of his time doing something other than his main work. This is not always well received by his direct superior, but it is nevertheless a written rule. It is also possible to make use in real time of the staff management tool which the head of human resources possesses. When we are looking for a specific talent, this tool allows us to identify who, among those who have the necessary ability, is currently not working at capacity and for how long.

Eventually, our aim is to have one of the members of each team devoting himself to the EBI on a full-time basis. In phase 2 of the deployment of the EBIs, we have ensured that the decision to transfer a person on a full-time basis to a project can be taken by the assessment committee.

The catalyst

Q. : *What is the budget for all the current projects ?*

M. E. : The budget for all the EBIs is a few million Euros per year, which is not huge but still significant.

Q. : *How many people are involved in these projects ?*

M. E. : A project occupies between 5 and 10 people. About fifty projects were submitted and 20 were accepted. The EBIs therefore only directly affect a small part of the employees, but the operation serves as an example and has a domino effect on the entire company, possibly with various modifications. The same is true of the Thales Awards which affect very few people, but are very conspicuous as it is the group's CEO who gives out the prizes. Each year, he hands out 9 medals : 3 gold, 3 silver and 3 bronze. As there are 6 divisions, each division should receive more than one a year on average. However, for the past three years, our division has been awarded three medals. Some projects which were presented at TechnoDay and then accepted for EBIs have been winners of the Thales Award. One can see that there is a sort of virtuous circle of innovation and reward.

The failures

Q. : *If a project is abandoned, how is the failure felt by the project managers ?*

M. E. : All the EBIs are regularly followed by a committee which may decide to stop the project at any moment. If this is the case, we draw the conclusions together and we try to highlight the positive aspects. Failures rarely mean that the idea was bad or that the project managers had not worked hard enough. Often it is the market which no longer exists, or that our competitors found an alternative solution. Sometimes the stress is too great for the team and this prevents finding a compromise. Sometimes the project comes across insurmountable technical difficulties.

All creative ?

Q. : *Is it possible that, step by step, an entire company can eventually become creative ? Does everyone show an aptitude for creativity ?*

M. E. : Some are obviously more creative than others, but group dynamics contributes a great deal towards allowing creativity to emerge. In England, I did a training course which taught me a lot about this. We were asked to reply to 600 questions following which we were divided into six categories : managers (who immediately take on the position of leader), workers (who get working straightaway), and wall flowers (who sit at the back of the room and who are disregarded because one thinks they have nothing to say).

Then they asked us to play a traditional game : each person was asked which 20 items they would bring if they were left on a desert island. In this type of game, one knows that there is no perfect answer, and the aim is to see how the group arrives at a consensus. The game took place in two parts. In the first part, each group was made up of people who had similar characteristics : at some tables, no-one talked, while at others, everybody was shouting at once. In the second part, the groups were mixed, with very different sorts of people, and this time, a consensus was reached in each team. The moral of the story is that not everyone is creative in the same way but everyone can contribute usefully to a creativity process.

As to the question whether a company can adopt a creative attitude, a study carried out by IBM in a number of companies in the world of innovation showed that one of the essential factors to aid creativity in a company was the active involvement of the entire company management.

Engineers and sales people

Q. : *The innovative projects which you have presented are essentially technological and similar to engineers' projects. Have you also chosen innovations in the area of marketing ? For example, one could think about renting radars rather than selling them, or selling batches, ('buy a radar, get a communication system free !'), or even setting up customer loyalty schemes.*

M. E. : I realise that the examples I have mentioned are very technological, but we have also validated EBIs in the service sector. The Thales group is used to innovating in areas other than manufacture. For example, one of our programmes in Germany consists of installing and then renting out training centres for helicopter pilots. One of the recent Thales Award winners went to a HR initiative welcoming newly employed people to a subsidiary in Australia.

My dual status of research and technology director on the one hand, and 'sponsor of innovation' on the other, has the disadvantage of giving credit to the idea that innovations which we research are necessarily technological whereas we are delighted when we are presented with innovations in marketing or human resources. In fact, I am the only technical person on the committee : all the others are non-technical.

Innovation in the process of innovation

Q. : *The EBI system is an innovation in itself. Where did the initiative come from ? With whom did you have to talk in order to create it ?*

M. E. : It is quite simple. I presented the project to the president, and 48 hours later, he said 'yes' !

Presentation of the speaker :

Marko Erman, PhD : graduate of the École polytechnique and the École Nationale Supérieure des Télécommunications. He is the research and technology director at Thales. Prior to this, he was in charge of technical and strategic operations at Alcatel and Philips. He is a member of the Académie des technologies.

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