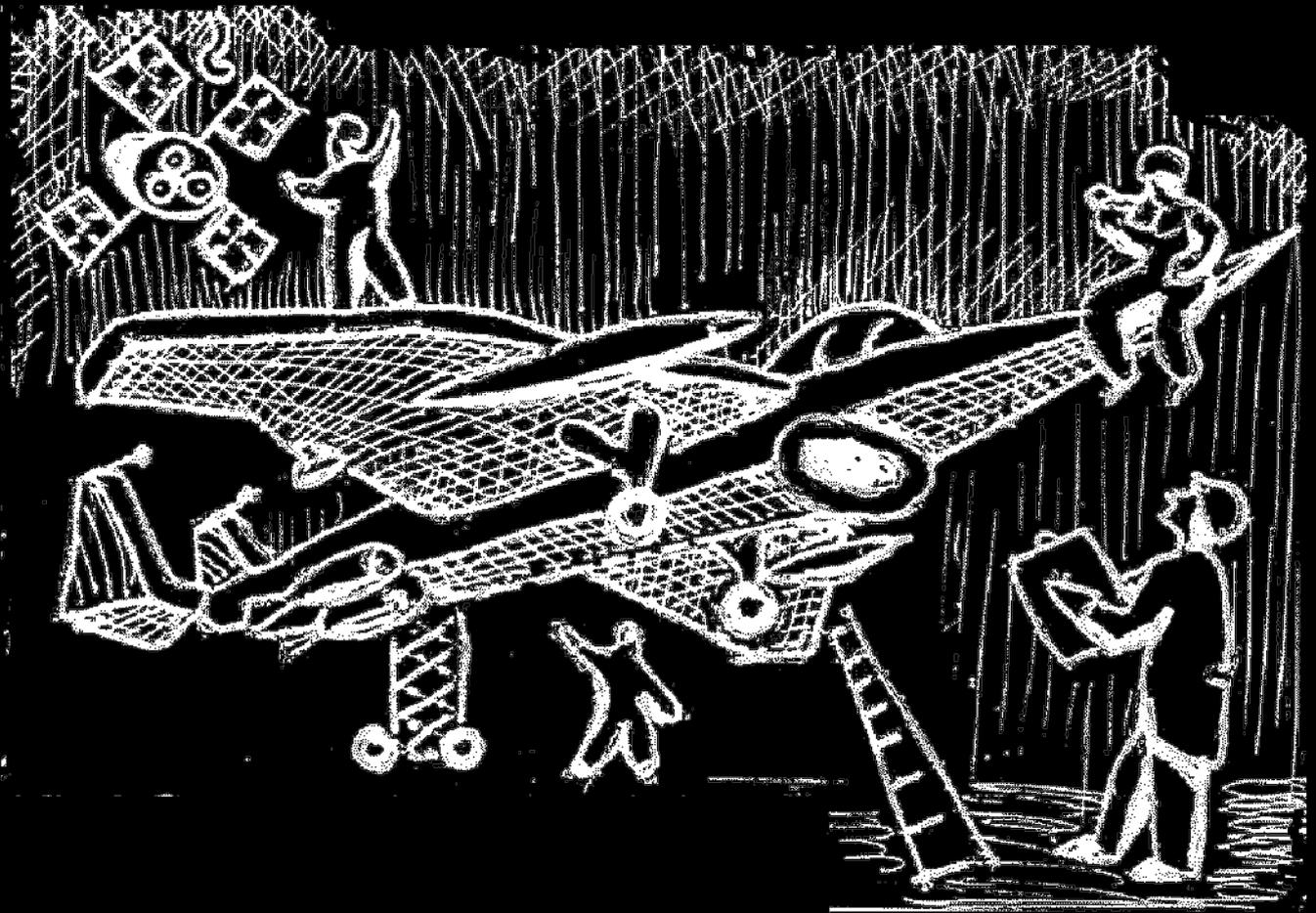# The Knowledge Management Journey of Israel Aircraft Industry

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The Knowledge Management Journey of Israel Aircraft Industry

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Abstract

Firstly, we tell the story of the journey of Israel Aircraft Industries (IAI) into Knowledge Management. We show how the plan was embedded in the company's comprehensive change program which focused on four core values: "Customer", "People", "Innovation & Technology" and "One Company". Knowledge Management has been originally part of the "Innovation & Technology" value – but in time managed to relate to, and support all four values. We then briefly describe the KM plan of the company and its 12 chapters. Several organisational mechanisms to support the implementation of the KM program are discussed, including performance measurement, the KM handbook and the distributed organisational structure of the program. We chose to describe in details one of the modules of the program – Fostering the knowledge of core Competence Centers. A systematic process to define such centers is outlined, and a list of many different ways to support and nourish such competence centers is proposed.

This case is concluded with a list of several tips which are especially valuable for large and complex organisations that attempt to address systematically the challenges of effective Knowledge Management. For example, we elaborate on the need to balance well planned and emergent initiatives, central and local resources, comprehensive strategies and step-wise implementation.

Keywords: Knowledge Management, Competence Center, Community of Practice, Change, KM Implementation, KM Measurement, Aerospace

Background

Industrial Context

It all started many years ago, before the Knowledge Management program in Israel Aircraft Industry (IAI) began to take shape. At the beginning of our collaboration, Edna Pasher & Associates consulted the IAI on the process of turning production and service units (such as the training unit) into autonomous profit centers.

The concept of "Profit Centers", which helped to create a business culture, had a problematic side effect: it also created internal competition. As a result of the pressure to show profit, the different business units of IAI began to compete with one another, sometimes over the same customer, and the culture that emerged was characterized by lack of knowledge sharing. It became clear that something had to be done about this. IAI was still perceived as one united company in the market, and the IAI had to overcome the lack of cooperation between the different units in order to improve and stay competitive in the changing markets of the 21st century.

As a result of this emerging need for unity, in 1997 the head of the Electronic Group at IAI turned to Edna Pasher & Associates as consultants, asking for ways to strengthen the subject of knowledge

sharing within the group. This will be further discussed in details. In addition, IAI started a Change Program in February 2000 aiming to define and implement various actions to support the four values established:

- Customers

- People

- Innovation and technology

- One Company

Knowledge Management was added as one of the actions of the "Innovation and Technology" value.

Back in May of 1997, Edna Pasher & Associates[1] met with the head of the Electronic Group. He felt there was a need to find ways in which to encourage and accelerate an atmosphere of cooperation and knowledge sharing among the 17 different "planets" of the group. The recommendation made was to hold a series of "knowledge café" events. Knowledge cafés are multiple-participants events in which a special technique is used to enable meaningful and fertile conversations for the establishment of knowledge sharing and for the encouragement of innovative group thinking. The events were advertised throughout the Electronic Group, and were opened to any of the workers who wished to come.

The first event dealt with several topics, such as "the reciprocal relations between the company – the group – the division", "intellectual capital management in the company" and others. Following were seven other events, which focused on a variety of issues: starting with "ways for enlarging the division's profitability", through "business intelligence" and "intellectual property". Meanwhile, as mentioned above, the change program of IAI started to evolve and emerge. That, along with the success gained from the "knowledge café" meetings, the IAI decided to invest in knowledge management as a milestone in the company's cultural change.

In March 2001, IAI established a steering committee whose objective was to define the knowledge management actions. It included experts in strategic thinking and processes, along with IT experts, and experts from the field of industrial engineering. The committee employed a team of three consultants (Edna Pasher & Associates, Ron Dvir of Innovation Ecology and Moria Levy of ROM Knowledgeware) who began with a comprehensive diagnosis process. This process included a survey of around 400 IAI employees, along with one hundred interviews of employees in numerous occupations and various levels of management. The diagnosis was limited by the steering committee to three subjects – engineering, production and maintenance.

The results of the diagnosis pointed at several issues of knowledge management that should be addressed:

- A gap was found between whom the employees cooperate with and whom they should be cooperating with, in order to achieve the best results.

- There was significant interest in communities of practice (CoPs).

- There were "competence centers" at IAI that showed expertise performance in technology-based development or at giving specific kinds of service, and those "knowledge islands" needed nurturing and investment.

- Employees gave a lot of credit to the method of best practices.

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[1] With the contribution of Michal Goldberg

- A need for a computation system that would enable better documenting and retrieving of knowledge was discovered.

It took the team a couple of months to establish and to summarize all the information collected during the extensive diagnosis process into a fully planned knowledge management strategy. Beyond the three activities mentioned above, the steering committee initiated a pilot for knowledge management implementation in one division, inclusive of all fields. However, opposed to the plan, the Electronics group wanted to begin implementing a knowledge management program of its own and unrelated to the company's effort.

Sounds like a problem? Not necessarily. We believe that almost all problems, including this one, could be turned into opportunities. And so, following the activity of this unit, we used the situation as a learning ground on what to do, as well as what to avoid, for the systematic implementation of knowledge management. The lessons we learned from the pilot became a valuable part of our diagnosis report, and later-on, of our strategic knowledge management plan.

Problem

This case presents several issues with which we dealt at the strategic level and at the implementation level.

- The most basic problem with which the whole project began, which we have already described, was the lack of knowledge sharing within the company. That was the result of the decentralized organizational structure of IAI. As a huge organization that includes over 30 units and around 14,000 employees, IAI is naturally susceptible to the lack of knowledge sharing.

- The biggest obstruction for knowledge sharing, as we learnt from the diagnosis process, wasn't the perception of knowledge = power, as found in numerous organizations. The obstruction of knowledge had to do with the "Not Invented Here" approach, which means: "it came from another organizational unit/division, so it's probably not relevant to us".

- Since IAI started a vast change process that involved the four values described above, another challenge it faced was the integration of the knowledge management along with it. The two programs, held within a two-year period, were in some aspects, addressing similar values ("One Company", "Innovation", and others), but in a different way and through a different focus.

- Another challenge at IAI had to do with "knowledge dripping". Many of the company's retiring employees were, after years of working, experts who held allot of valuable knowledge, which they took with them when they left.

- There was a problem of "re-inventing the wheel" found throughout the company. It was even more meaningful due to the fact that the work at IAI is usually done in the form of projects, typical of a vertical structure. We found that there was a need to improve the amount of learning that was done from one project to another. Recently, IAI has been trying to deal with this problem by managing its projects using the Integrated Product Team (IPT) method.

- Possibly the biggest challenge found was innovation. We discovered that although there were strong innovative powers in the company, they were all local powers. A massive and systematic emphasis on the encouragement of innovation was needed.

Learning Objectives:

- Integration the knowledge management program to the existing company values, strategy and processes.

- Establishing an implementation plan that combines the different aspects of knowledge management into a coherent conceptual framework, which covers the "life cycle" of knowledge.

- Creating a system for monitoring and passing down the knowledge management plan to all hierarchal levels.

- Establishing a framework for measuring the progress and achievements of the implementation process.

- "Competence centers" as a procedure that encourages knowledge collection, knowledge sharing and innovation.

- Establishing "communities of practice" in a distributed company with separated organizational units.

- Creating a support structure.

Approach

The analysis of the IAI case is based on a "*participants as observers*" approach. One of the authors was a member of the KM steering committee at the earlier phase of the project, and was then nominated as the company Chief Knowledge Officer. The other two authors took an active part throughout out the KM program creation and introduction process, as process and content consultants, workshops facilitators and analyzers in the three parts of the case described in this chapter, namely strategy formation, Communities of Practice building, and Competence Center creation.

Conclusions were based on a relatively large number of "mini-cases" – about 15 CoPs and 38 Competence Centers that were explored.

For the analysis we used a large body of documentation:

- The KM handbook.

- A comprehensive set of documentation referring to the program and to its implementation in IAI

- The metrics related to KM, documented in the company overall implementation management system – the Policy Deployment Model (PDM).

- The detailed documentation and planning forms of each of the Competence Centers, based on a standard template.

For the purpose of this case study, we focused our attention on a general analysis of the program and on one specific application – the Competence Centers. The reason for choosing this particular application out of 12 procedures covered in the IAI KM program was that this application surfaces many of the human, cultural, business and technological challenges related to KM in a company with the characteristics of IAI.

Case Analysis Part I: The Strategic KM Program

Knowledge Management as a Comprehensive Program

The Change program of IAI started in February 2000 with the definition and implementation of the various actions backing up the four values established:

- Customers

- People

- Innovation and technology

- One company

Knowledge Management (KM) was established as one of the actions for the "Innovation and technology" value. In fact Knowledge Management turned out to be part of other defined actions within the program (as the process of identifying core competence centers within the various divisions, the "Customer intimacy" action – intended to create a sense of closeness between the customer and IAI employees at all levels, or the action to implement debriefing as a regular way of proceeding after any meaningful event, created within the context of a "learning organization") (Dayan, 2003).

The purpose of Knowledge Management has been to foster innovation and to create and share knowledge, in order to promote business goals. IAI, therefore defines knowledge management as the process of identifying, capturing, leveraging and creating knowledge to deliver value to our customers.

Various frameworks represent knowledge management implementation in different companies. Some are minimizing and suffice with an Intranet having the task of sharing knowledge; some are implementing sharing through the ever popular "Communities of Practice". We believe Knowledge Management should be viewed as a comprehensive program including all phases in its life cycle, so we have presented it for implementation divided into four chapters:

- Knowledge Capture and Documentation

- Knowledge Retrieval for Re-Use

- New Knowledge Creation

- Knowledge Sharing

The ultimate goal of the Knowledge Management action being to achieve a required Competitive Advantage, we have phrased out for each chapter specific procedures to perform the required activity and to measure their influence and effect on business results.

We have made our utmost to create within the implementation of the program an open mind for IAI employees to view their own world as part of a much larger environment, including customers, partners, and suppliers, within the context of the "extensive enterprise", but with competitors as well, to bring in Knowledge from the outside world and transform it into Knowledge based products and services.

The program approved by IAI management includes the appointment of a full time Director of Knowledge, who operates under the hospices of the Vice President for R&D and Strategy, and in addition, the appointment of a part time Knowledge Manager for each and every division and headquarter organization to initiate and coordinate the activities within the division (about 30 people all together).

Upon initiation, a steering committee was instituted with representatives from all IAI groups as well as from the corporate organizations. The various tasks of the committee included the update of the

Knowledge Management strategy, setting priorities for the implementation of the program, and controlling the program budget management.

The Knowledge Management Vision

New Knowledge

Will be created,

Shared,

And reused,

As part of IAI personnel's common practice,

For the achievement of IAI's vision

And the fulfillment of its goals
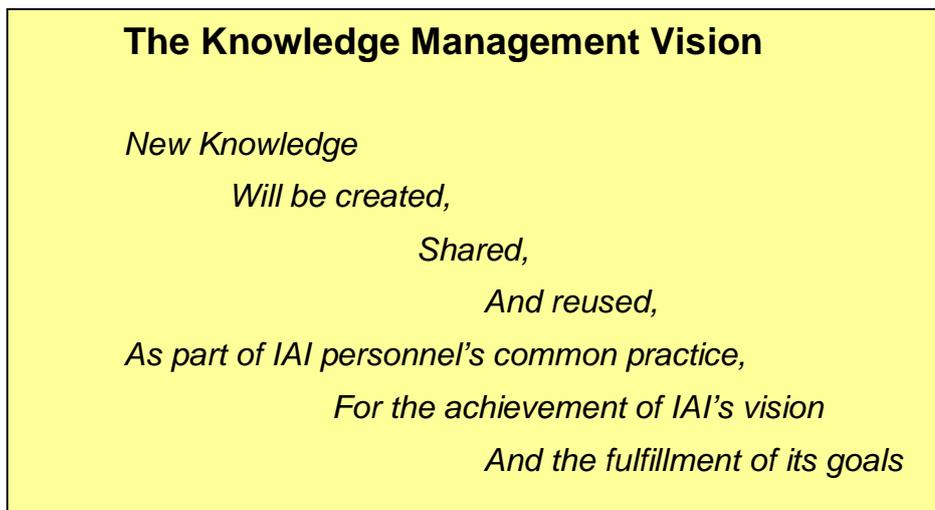
Figure 1: The Knowledge management vision

The Knowledge Management Chapters

Knowledge Capture and Documentation

This is the basis of Knowledge Management. Without it, there is no room for retrieval and re-use. IAI employees gather a great deal of knowledge along their work – professional Knowledge coming from experience, knowledge about processes, about projects, about the external environment (customers, suppliers, opportunities), or about company products. In many cases, this knowledge remains with the expert and is not available to others. Knowledge capture and documentation enable the extraction of this knowledge to become a strategic asset by replacing tacit with explicit and personal with organizational.

Knowledge Retrieval for Re-Use

Retrieval and re-use of existing knowledge prevents us from reinventing the wheel time and again, prevents us from reiterating previous mistakes and enables the duplication of successes; thus, fostering professionalism, making processes more efficient, and diminishing development cost and time to market.

New Knowledge Creation

In a time in which competition constantly increases and in which time, quality and budget are of essence, knowledge creation and innovation are a vital necessity of any organization and the capture and re-use of existing knowledge are no longer sufficient to cope with the rate of growth necessary for the organization to stay ahead of the competition.

Knowledge Sharing

In a competitive market, in which time-to-market is constantly shortening and competition is about alertness, price, innovation and professionalism, knowledge sharing within the organization is an essential condition to its sustained success.

Implementation

The Knowledge managers convene once a month, each time in a different division, to get insight about local successes and difficulties and also to discuss common issues related to the implementation of the program. At one of the first of these conventions, the Knowledge managers voted for a set of procedures to support the four above mentioned chapters and they are:

Knowledge Capture and Documentation

- Critical Knowledge capture
- Lessons learned extracted from debriefings and from day-to-day activity
- Content management

Knowledge Retrieval for Re-Use

- Fostering the Knowledge of core competence centers
- Knowledge in price proposals
- Establishing a business Knowledge base
- Establishing a technological Knowledge base

New Knowledge Creation

- Knowledge extracted from the innovation process
- Knowledge created along the new product initiative process

Knowledge Sharing

- Communities of practice
- Generating best practices
- Using portals to share Knowledge

A general overview of the program is shown in Figure 2.
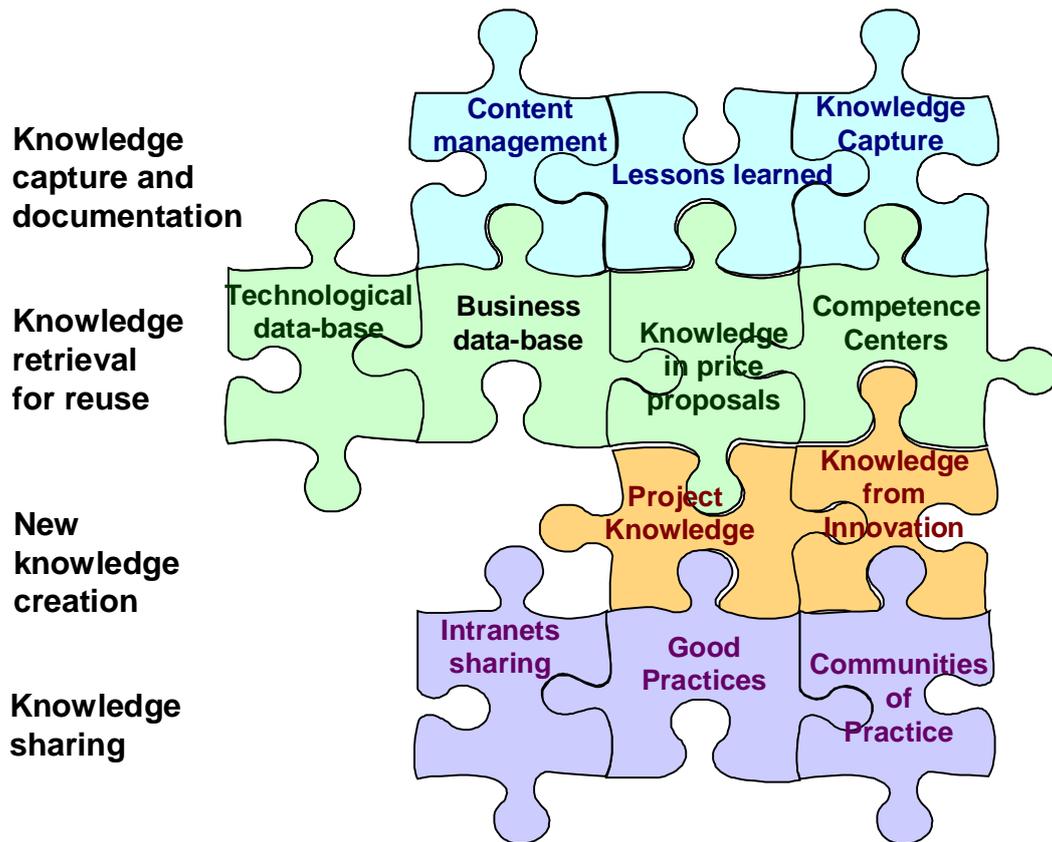
Figure 2: The program's chapter and procedures

The KM Handbook

Given the comprehensive nature of the Knowledge Management program, Knowledge managers are required to carry out at least one procedure out of each of the above chapters.

For the purpose of having a standard set of procedures describing the various processes mentioned above, a Knowledge Management handbook was written and published within IAI with the help of Edna Pasher & Associates. Its purpose has been to commonly answer across IAI questions as to why, what, who, how and when do we do anything to support the full life cycle of Knowledge Management. Each and every procedure is described in details though the handbook as a whole gives a complete picture of the program to enhance its comprehensive nature. For each procedure we have included the following sections:

- Introduction and definition of terms
- The requirement
- Purpose and goals
- Process description
- Technology and other resources backing
- Organization
- Measurements
- Cultural content and training required

Monitoring

The process used by IAI for the management of its change program (inclusive of the Knowledge Management program), is based on the Hoshin Kanri method[2] (Kondo 1998). Hoshin Kanri is a Japanese technique for deploying company strategy down to an individual's annual objectives. Thus a logical link is made between the CEO's intent and the individual daily actions. Hoshin Kanri can be literally translated as Policy Management, but in the anglicized world, "Management" has become "Deployment" (Palmer 2004). The Hoshin Kanri process is first, a systematic planning methodology for defining long-range key entity objectives. These objectives are planned for the following year and do not change within the year. Second, the Hoshin Kanri process does not lose sight of the day-to-day "business fundamental" measures required to run the business successfully. This two-pronged approach provides an extended period for the organization to focus its breakthrough effort while continuously improving key business processes on a day-to-day basis.

Hoshin Kanri ensures that everyone in the organization is working toward the same end. The plan is hierarchical, cascading down through the organization and to key business-process owners. Ownership of the supporting strategies is clearly identified with measures at the appropriate level or process owner within the organization.

In the Hoshin Kanri process, strategic planning is systematized: The format of the plans is unified via standards. The standardization provides a structured approach for developing and producing the organization's strategic plan. The structure and standards also enable an efficient linkage of the strategic plan through the organization. This ultimately leads to an organization-wide understanding of not just the plan but also the planning process.

The hierarchical linkage attribute of the Hoshin Kanri plan occurs because of the passing-down process of the plans at each succeeding level. This is the cascading attribute of the Hoshin Kanri planning process. It is a very important step in empowering the organization. As each succeeding level accepts its portion of the plan, it has been involved in the plan's development by adding detail where it can best contribute and add value. This is also, how the organization buys into the plan; it now has some ownership of the plan itself. The Hoshin Kanri methodology is a strategic planning process with the built-in ability to empower the organization.

Measurement

The Knowledge Management program made it a point to continuously stay linked with the operational and business measures of the division. We are now measuring practically everything we do within the change program in IAI and the Knowledge Management program is different only in that it didn't limit itself to plain performance measurement, but went an extra step in defining three levels of measurements:

- Performance measure
- Throughput measure
- Result measure

To clarify the measurement process, we will use the "communities of practice" procedure as an example to describe the measure levels:

- Performance - we are measuring the number of people joining the community, the frequency of their meetings, the members' attendance, and the amount of knowledge shared.

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[2] The subject has been addressed in a workshop at the KM-Asia Summit in Singapore in October 2005.

- Throughput - we have required communities of practice within IAI, to self determine goals. The achievements of these goals, or the generation of best practices out of the meetings, are throughputs to be measured.

- Result - we are aiming at finding a relationship between actual business results and Knowledge Management activity. Measuring those results that are directly or indirectly accountable to throughputs of the community are a result measure.

IAI is using a method of self-assessment for the implementation of various processes across the company. The knowledge management implementation is self-assessed as well. The method is based on the well established capability maturity matrix (CMM) that grades in 5 levels the depth to which an organization has arrived in the implementation of a given process:

- Awareness

- Training

- Understanding

- Commitment

- Habit

At least twice a year, a committee internal to the division and appointed by its GM assesses the level achieved in the implementation of KM in the division. This is done using a detailed set of questions about every aspect of the program.

The questions seek an appraisal of the locality of the implementation, as opposed to processes characterizing the whole organisation, the occurrence of throughput of it and the awareness to its affect of the operational and business results. Another issue being assessed, is the level of the source of initiative to the program – does it stay at corporate level or does it go down to the division, to the directorate or maybe even to the personal level. The leveled approach to assessing the maturity of the assimilation of a process is a matter of essence. The mere awareness of what "is done" in this process can not be but the very beginning of the implementation. The next stage is the methodological one in which the details of "what is done" are now being trained and implemented, creating a common language. Only when you understand a process, you can fully implement it, not only by the word, but also by the spirit. Then comes the commitment phase and only latter the process implementation becomes a habit and is not considered a process anymore.

The internal assessment is moderated on a yearly basis, by a team external to the division that includes IAI's director of knowledge, a representative of the KM steering committee, and a knowledge manager from another division. Those results are negotiated with the division's management whose purpose is to learn from the assessment in order to correct its implementation method and improve its results. Building on the cultural content of the KM program, the self-assessment results are also positively published on the intranet and are another source of internal competition within the company to give it a catching effect.

Senior Management and Employee Support

Senior management is involved in the program in a few ways:

- The General Managers of the divisions are considered as the customers of the program. Once a year, during the period in the fourth quarter allocated for planning for the following year, they set their goals and targets. These are picked by the knowledge manager who then establishes the KM program for the following year, choosing procedures to better achieve the division's goals. These constitute the basis of the plan for the following year program.

- Communities of practice in IAI are induced self-organizations. That is to say, management is involved in creating the opportunity for the communities to form, and then, their participants are left to decide by themselves if they want to join the community. To each community a sponsor belonging to the top management level of the company, is assigned. The members are required to vote on a set of common goals they are committed to, but the sponsor approves those goals. This process creates an involvement of management that helps both ways.

Case Analysis Part II: Competence Centers

Background

Out of the many modules of the comprehensive KM program of IAI, the company chose to focus in 2005 on "competence centers". The CKO realized that in an engineering based organisation, this mechanism could bring about significant results.

During the period of April 2005- November 2005 we ran 38 workshops with 38 competence centers – and each was based on an in depth conversation with key players of the existing or emerging center. The analysis in this section is based on these workshops.

What is a Competence Center?

IAI uses the following definition:

> "*A competence center is an employee or group of employees which are responsible for a specific knowledge domain (that includes databases, information and expertise) and are capable to turn this knowledge into value to the company and its customers. A competence center can be a technological, operative or production group which provides the company with a business and competitive advantage and is critical to the nourishment of existing business lines or to the development of new ones*".

What do Competence Centers do?

Each competence center has a clearly defined mission, which is related to the provision of specific business related services to the internal and external customers of the company. In addition to its main mission, a competence center is expected to fulfill several roles which support the creation, documentation and sharing of knowledge related to the center's expertise area:

- **Mapping** the current knowledge situation of the organisation and identify emerging knowledge needs of the center's internal and external customers..

- **Turning** tacit knowledge of the individual experts into tangible documented information which is accessible to more employees.

- **Continuously developing** the expertise of the center and the organisation and ensure it remains as a market leader and is well updated with the state-of-art knowledge.

- **Identifying** of emerging and disruptive technologies as well as global trends.

- **Sharing** the center's expertise with other functions in the organisation.

- **Distributing** information about the center's expertise and knowledge.

- **Exploiting systematically** the center's competencies to the needs of the various units of the organisation.

- **Marketing** the center's marketing (internally and externally) and actively developing the demand for its knowledge and services.

- **Managing, creating, exploiting and protecting** the Intellectual Properties created by the center.

- **Nourishing** the "next generation" and systematically coaching and training new experts in order to ensue continuity of the center's competencies.

Characteristics of Competence Centers

We came across diverse types of competence centers in IAI which can be described along the following dimensions:

Lifecycle stage: Few centers are groups which exist for many years and seem to be beyond their peek. Others are mature centers, and few of the centers are just emerging.

Focus: the centers are categorized into technological, operative and production centers. Clearly, the most important ones in IAI are the technological ones thus most efforts were invested in these centers. However, in some cases this clear cut distinction is not as clear.

Size: Most competence centers include about 5-10 members. However, there was an exception of a one person competence person.

Organizational composition: some centers have been homogenous and included members from a single organisational unit; some were based on members from different units, sometimes from different plants and divisions. However, it was decided not to include experts from outside the company. In the case of such resources, they were considered as external strategic interfaces and sources of knowledge.

Distribution of knowledge: in some centers the same body of expertise is common to most members, in others there are clear distinctions and expertise is well distributed between the members. In some centers there is a clear top expert who is clearly more knowledgeable than the others in all expertise areas of the center.

Challenges

Some of the challenges which were addressed by the competence centers were common to all of them (and indeed, are common to other aspects of KM as well). Other challenges were relevant only to a few centers. When you read the following list, you will probably identify interlinks between the listed challenges:

- Lack of time – many experts claimed that they are overloaded with their day to day work (either routine processes or fire fighting) and don't have available time to invest in activities dedicated to knowledge sharing, for example.

- Lack of resources – the members of many competence centers pointed out that resources for KM fostering activities such as training courses, participation in conferences and sometimes even investment in information technologies are scarce.

- Lack of management attention – members of several competence centers felt that the awareness of their top managers to the criticality of investing in nourishing competence centers is limited. In these cases, management focuses mostly on achieving the operational goals of their units.

- Internal competition – as a result of IAI's divisions being profit centers, the internal competition between the businesses units is unavoidable. As a result, barriers for knowledge sharing between experts from different divisions and plants are considerable. In the recent years, the value of "one company" has been promoted and there is some progress in knowledge sharing, e.g. in the case of company wide Communities of Practice. However, internal competition is still a limiting factor to full knowledge sharing.

- Aging workforce – like the case of similar organisations in aeronautics and defense, the average age of IAI employees is relatively high. In many competence centers there are no or only one young employee. This poses two challenges: A. continuity of the competences base: what will happen to the knowledge of the experts, when they retire in few years? B. low energy levels in some cases, limited openness to new ideas, and lack of fresh perspectives.

- Mind set – in some competence centers we observed minds sets which are not compatible with a knowledge sharing and exploration culture. For example: "*each expert needs to know only about his own expertise area. There is no need to organize regular knowledge sharing meeting of experts belonging tour multi disciplinary competence center*". And also: "*There is nothing we can learn from the equivalent competence center in plant X. We are far more progressing*". And also: "*Our field is mature, there is no technological progress and no need to explore new directions*".

- Lack of learning and development opportunities – in some cases, the only real channel to acquire expertise in new technologies is through R&D projects. However, scarce resources for self funded research activities limit the options of some competence centers to prepare for the introduction of new technologies.

- Disappearing technology – in the case of one center, the expertise is focused on a technology which will disappear in a few years. The competence center is retained in order to support old products owned by the company customers. Would this lead to the degradation of the center?

The Implementation Process

The paths IAI took to implement the approach of competence centers are described in the following chart:

2003

> IAI Strategic KM outlined. Center of Competence is one of the modules

2004

> IAI KM Handbook created and published, incld. A chapter on competence centers

> Focused efforts on other modules e.g. CoP

2005 (Pilots)

> Implementation of Competence Center is added to the company PDM measurement system

> IAI chooses to introduce the Competence Center approach during 2005

> Each Plant knowledge manager, assisted by the CKO, chooses two pilot competence centers

Approx. 40 competence centers during 2005

> **An introductory mini-workshop (three hours) to each competence center**
> **Participants:** Plant knowledge manager, key/all members of the existing/emerging competence center , sometimes a senior manager, facilitator
> **Content:**
> A. Introduction presentation and conversation: what is a competence center, objectives, roles, players (based on the handbook).
> B. Co-creation of the center's profile, using a template which is completed during the workshop. Template covers the following issues:
> ❖Roles – leader and content manager
> ❖Mission
> ❖Expertise areas
> ❖Missing expertise (knowledge gaps)
> ❖List of experts (and specific expertise areas of each)
> ❖Interfaces with customers, strategic knowledge collaborators.
> ❖Competitors (and relative knowledge advantages)
> ❖Intellectual property and other information assets
> ❖Current knowledge processes (learning, sharing, documenting, etc.)
> ❖Work plan for next year – practical actions that can progress the competence center
> ❖Initial structure of the competence center's portal;
> **Output: awareness, profile of the center, draft work-plan**

> Competence center meets several weeks after the workshop with its managers to refine work plan and start initial implementation of the agreed action items

2006 (Full Implementation)

> Introducing the approach through the workshop to more/all competence centers in each unit of IAI

> Intensive implementation of the work plan of each center
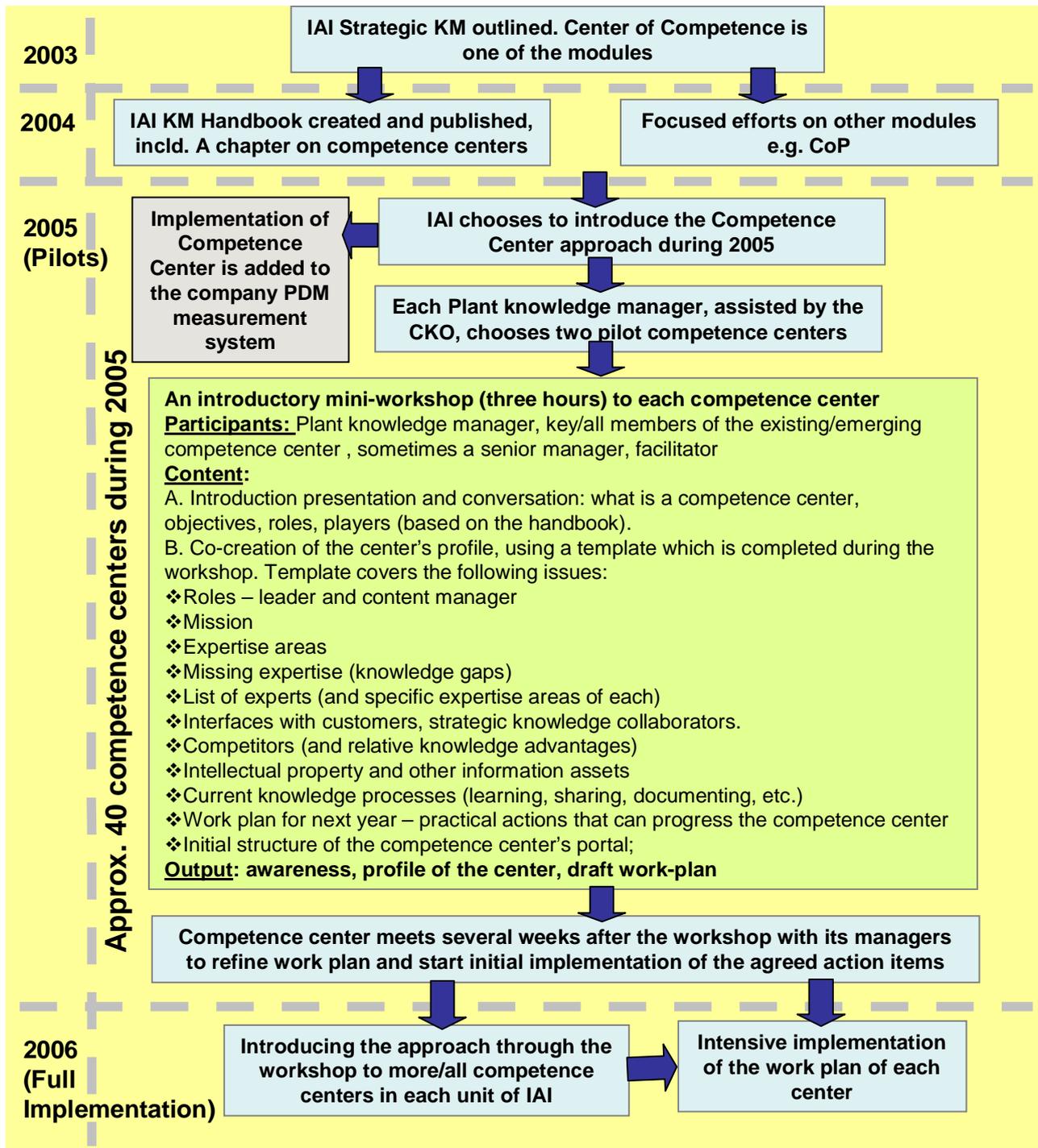
Figure 3: The implementation process

The Players

We identified six groups of stakeholders and function related to a competence center:

The competence center leader – this is the person responsible for the KM related activities of the center, e.g. knowledge sharing, continue learning etc. In some cases it is the group manager, in other cases it is one of the experts who is interested to pursue this challenge.

The content manager – this is the person responsible to coordinate the processes of documenting and making available the center's knowledge. Typically, he or she is also responsible for the center's portal and other information technologies assets.

The EXPERTS – these are the core players. In a typical competence center there are 5-10 experts. While we didn't use a formal definition, we linked "expertise" with extensive experience, excellent skills in a specific area, hands-on competencies to deliver and a distinct capability to solve problems and support others who seek advice, help, guidance and second opinion.

The top manager – this might be the plant or directorate manager, who is expected to support the center by publicly recognizing its importance, approving its work plan, providing resources, highlighting priorities and monitoring performance and progress.

The local KM manager – this is the division, plant or directorate knowledge manager, who is expected to support the competence center throughout its lifecycle.

External players – internal customers, local customers, members of other competence centers within and outside IAI.

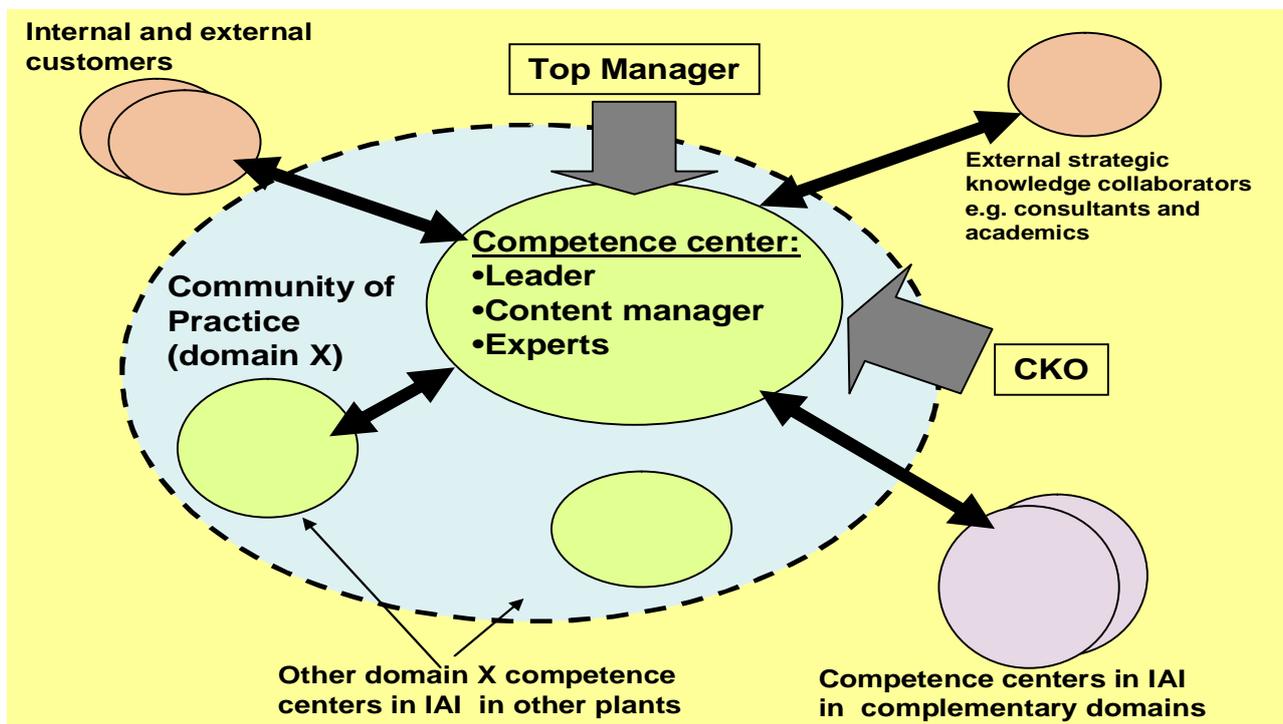Figure 3 outlines a typical constellation of a competence center:

Figure 4: A typical constellation of a competence center

33 Ways to Nourish a Competence Center

In this section we report on many practical activities that can enhance the competencies of the Competence Center and support it in actively "managing its knowledge". All of these ideas were

suggested by the center's members in the competence centers workshops, and some are already implemented. Clearly, some of these ideas are applicable to all centers, and others are relevant only to few of them.
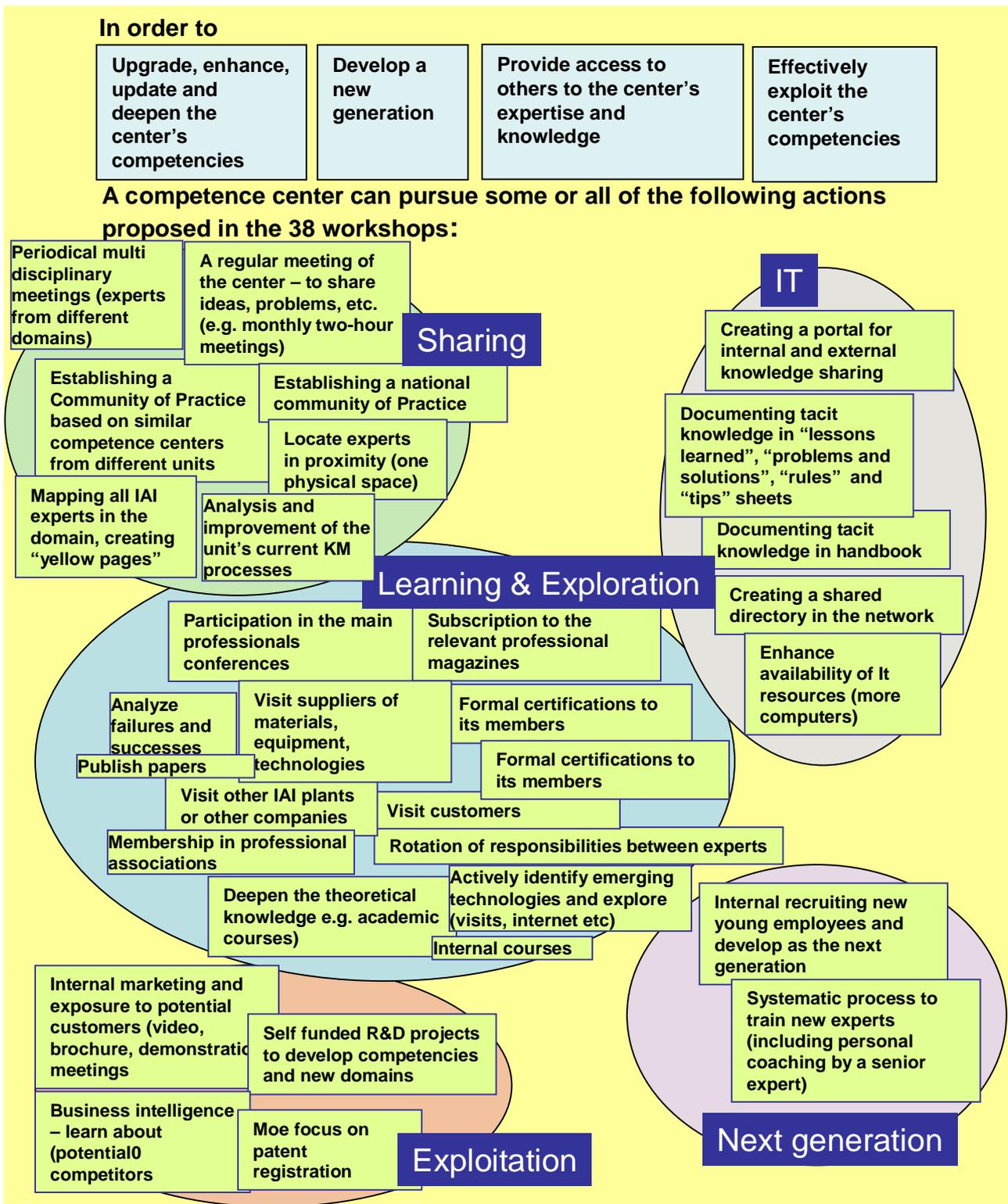
In order to

| Upgrade, enhance, update and deepen the center's competencies | Develop a new generation | Provide access to others to the center's expertise and knowledge | Effectively exploit the center's competencies |

A competence center can pursue some or all of the following actions proposed in the 38 workshops:

Sharing

- Periodical multi disciplinary meetings (experts from different domains)
- A regular meeting of the center – to share ideas, problems, etc. (e.g. monthly two-hour meetings)
- Establishing a Community of Practice based on similar competence centers from different units
- Establishing a national community of Practice
- Locate experts in proximity (one physical space)
- Mapping all IAI experts in the domain, creating "yellow pages"
- Analysis and improvement of the unit's current KM processes

IT

- Creating a portal for internal and external knowledge sharing
- Documenting tacit knowledge in "lessons learned", "problems and solutions", "rules" and "tips" sheets
- Documenting tacit knowledge in handbook
- Creating a shared directory in the network
- Enhance availability of It resources (more computers)

Learning & Exploration

- Participation in the main professionals conferences
- Subscription to the relevant professional magazines
- Analyze failures and successes
- Visit suppliers of materials, equipment, technologies
- Formal certifications to its members
- Publish papers
- Formal certifications to its members
- Visit other IAI plants or other companies
- Visit customers
- Membership in professional associations
- Rotation of responsibilities between experts
- Deepen the theoretical knowledge e.g. academic courses)
- Actively identify emerging technologies and explore (visits, internet etc)
- Internal courses

Next generation

- Internal recruiting new young employees and develop as the next generation
- Systematic process to train new experts (including personal coaching by a senior expert)

Exploitation

- Internal marketing and exposure to potential customers (video, brochure, demonstratic meetings
- Self funded R&D projects to develop competencies and new domains
- Business intelligence – learn about (potential0 competitors
- Moe focus on patent registration

Figure 5: 33 ways to enhance capabilities of a competence center in IAI

Results and Business Impacts

Key Findings

Three years into the program, all divisions of IAI have implemented KM in different degrees. One of the syndromes, preachers of Knowledge Management encounter is the response by proposed practitioners that they have been managing their knowledge (without capitals) all along, though they do not use the term KM. Well, it does make a difference to do it intentionally and methodologically. The framework of the program, the specific procedures in place or even the details of their definition are less important than the process of implementation and it being systematic (Frank, 2001).

We have dedicated the first and second years of implementation to lecturing, teaching and even tutoring the details of the procedures using the Knowledge Management handbook, published on the Intranet and with the help of the Knowledge Managers. This has been done at all levels, starting at the management level of the division. This was performed by the company's Director of Knowledge himself together with the local Knowledge Manager who gave the home touch with recognizable examples. It then proceeded to middle management by the Knowledge Managers who, in order to get the attention of their audience at this stage had to be very specific about what needs to be done and what's in it for them and their departments. Finally, it was carried out by the General Managers to the personnel level at periodical communication meetings at which they present their policy and point out subjects to concentrate on.

On the second year of implementation we focused on the consciousness of the link between the division's goals and the chosen KM procedures. We did that using the attributes of the Hoshin Kanri method. This is particularly important to get management at all levels buying into the program. It indeed delivered as we had more and more GMs associating with the program and KM procedures better applied to local situations, environment and goals.

On this year we also concentrated on the Community of Practice (CoP) procedure. We have defined CoPs in IAI as organizations having a common subject which is of the interest of the company, you volunteer to be part of (but once you do, you are committed to it), and which has goals community participants have voted for (typically goals matching their own needs or the needs of their departments). We have established already over 15 technological communities of practice (dealing with a specific technology that maybe implemented in quite a few divisions), about 5 procedural communities (dealing with a common basic procedure), and another 5 organisational communities (dealing with people from a similar organization in various divisions). The major worry was about the technological communities that required people from different divisions that were competing against each other up to now to cooperate in order to mutually improve their capability. As long as we kept the community at the technological level and didn't venture into the business level, it has worked beautifully, and these communities are now flourishing while the ties between those people that started as technological grew into social ties that sometimes are even stronger. Another myth that was shattered in the process is the famous "knowledge is power" one. Instead of encountering the expected restrain of knowledgeable participants from telling what they know to those in need of that information, we found people eager to tell their story to an audience which was sometimes reticent to admit it needed the knowledge. The new myth therefore created is – "sharing knowledge is power".

The third year of implementation was chosen to be the year in which we would start concentrating on the fostering of our technological competence centers, as was described in the previous chapter. During this year we worked with some 40 centers, and we plan to triple this number on the fourth year.

Business Impacts on IAI

The world is changing, and organizations can't stop the world from changing. The best they can do is to adapt - the smart ones change before they have to; the lucky ones manage to scramble and adjust when pushed; the rest are losers - they become history. In the final analysis, the customer determines the winners from the losers. IAI is learning to become a learning organization, one that is better prepared for a changing world and Knowledge Management is leading this effort. This is true for process knowledge as well as for design already invested in and retrieved for reuse.

A major part of this knowledge refers to defined and documented processes in the various competence centres of the company (some of them technological while others are procedural). The rest remains in the generalized term of tacit knowledge which refers to the experience of the company's people, in their head and memory or at the tip of their fingers. The Capability Maturity Model Integrated (CMMI^{SM}) deals with the ways an organization has to follow, in order to maintain well mapped processes, having well defined stages, because of the assumption that in mature organizations, it is possible to measure and relate between the quality of the process and the quality of the product. IAI is trying nowadays to qualify for the CMMI^{SM} highest level possible (at least one of our divisions is already qualified for level 3 while quite a few are already at level 2).

> *CMMI^{SM} enables you to assess your organizational maturity and process area capability. It identifies priorities for improvement, and provides guidance on the implementation of these improvements. On the other hand, applying KM can bring enormous tangible and intangible benefits. These two area studies have different scope but similar methodologies such as maturity models and the evolvement through the processes. Interestingly, in the recent studies, one has taken effects on the other. We can see CMMI^{SM} levels and models applied to some KM models, and KM techniques applied to CMMI^{SM} activities. No matter how they affect each other, it is believed that the debates and learning from each other should improve them both. Further, to learn from both of the two studies can obtain the knowledge and clear concept of the operation of the organization as well as problem solving capability. When Knowledge Management is used with the Capability Maturity Model Integrated, the organization becomes more efficient and effective in the development of the projects they are used on* (Dayan, 2006).

Divisions which are choosing business result measures, are actually taking upon themselves to adapt their Knowledge Management activity to the level needed in order to reach the goal prescribed in their PDM since the beginning of the planning year. This is only starting to happen and is a sign, people at IAI are only now beginning to consider KM as an enabler for extracting the maximum of the potential they, their departments, and their divisions have.

Impact on Other Organisations

The authors believe that this case is a valuable source of ideas especially for large and complex organisations such as automotive or aeronautical industries. Such companies can learn from four aspects of the case:

1. How a large corporation can deploy the values, policy and practices of Knowledge Management throughout the organisation. This is a non trivial task and some of the methods used by IAI can be useful in other cases.

2. How to link a KM program to large company wide change program such as lean manufacturing. In this respect, how to integrate the measurement of KM related challenges and performance with a general performance measurement system.

3. How to define and support competence centers in a systematic way.

Conclusions

The IAI knowledge management project can be declared as a successful project. It is still continuing to evolve and has created an organizational effect in the past 4 years.

Factors that contributed to the success:

- Most importantly the top management's support of knowledge management issues, and it's willingness to allocate resources for this purpose.

- Building the knowledge management program in a way that enables it to fit with the main macro change plan that the company is assimilating, so that the two programs support and strengthen one another instead of competing with each other.

- Planning and establishing the knowledge management program so that it corresponds with the company's existing culture. Being an organization run and dominated mostly by engineers, the IAI culture appreciated a plan that would be very structured, very defined, and included precise objectives, and comprehensive measurements.

- Using a multi-disciplinary team of consultants, brought different perspectives and capabilities into the teamwork, while collaborating among themselves and with the client.

- Having a "fanatically dedicated", full time knowledge manager, who is totally committed to the mission was a strong in-house force that set the program in motion. Moreover, the fact that the knowledge manager appointed, was from the R&D unit, a strong influential unit, also contributing to the success of the project.

- Establishing an organizational structure for the knowledge management plan that included part time knowledge managers in every unit of the company, creating a strong organizational distribution of commitment and responsibility for the issue.

- Developing the "knowledge management user guide" that communicates the values, tools and measures of the plan to the knowledge managers of the various units, and is kept updated.

- Creating a strategic plan which covers almost every critical aspect of the company. But at the same time, introducing the plan in a stepwise mode, each year adding two or three additional "modules".

- Focusing on "competence centers" and "communities of practice" while each one established gets a "kickoff" workshop that enables it to succeed.

Practical Tips and Key Lessons:

- Integrate the KM program with other change programs, which are introduced to the company rather then managing it as a stand alone initiative.

- Continuously stay linked with the operational and business measures of the division.

- Start with the core business processes of the company.

- Create a comprehensive plan, but then implement it gradually, introducing every year a few new components of the big plan. Don't try to address all challenges in one go.

- Balance cleverly between corporate central efforts and local initiatives in order to maximize impact at the local level but at the same time enable knowledge sharing across the company.

- Balance cleverly between pre-defined procedures and initiatives, which evolve without preplanning.

- Appoint a KM manager (or "ambassador", or "CKO" or "champion" etc) in each important unit – to ensure good deployment of policies and practices. Support these people and help them create an internal network.

Acknowledgements

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Authors' Biographies

Rony Dayan is a retired Lt. Colonel of the Israeli Air Force, with industrial experience as deputy GM of MBT, one of the Israel Aircraft Industries successful divisions (http://www.iai.co.il). Before that, he was the corporate marketing representative in South East Asia where he received the IAI President Marketing Award for outstanding performance. Rony has been leading the effort to incorporate Knowledge Management in the company's set of actions for the implementation of a comprehensive change program (for further information on the IAI KM program please click here). The program is being implemented now across the five groups and twenty divisions of this 2B$ Aerospace & Defense company. (http://www.iai.co.il/site/en/iai.asp?pi=15166&doc_id=21797). Rony has also given courses in Business & High-Tech Marketing and is preparing a course in Industrial application of Knowledge Management for the School of Business Administration at the Israeli College of Management. He holds an Engineering degree from the Technion in Haifa, Israel, and a Masters Degree, both in Electronics, from the US Air Force Institute of Technology at Wright Patterson AFB, in Dayton, Ohio, USA. Rony has been presenting the subject of knowledge management in international conferences along the last three years, and has published two articles on relevant issues. Rony Dayan's research interests are in the field of Knowledge Management and of measuring its performance and impact in a large corporation; he is also now studying for a PhD at Cranfield University in the UK on this subject.

Dr. Edna Pasher founded an international strategic management consulting firm in 1978. The firm provides customized consulting services to organizations both in the private and the public sectors. Edna Pasher Ph.D & Associates specialize in assisting their client organizations to speed up strategic renewal in a fast changing environment. In 1994 Edna identified knowledge management as the critical success factor for organizational renewal and has become the pioneer and leader of the knowledge management movement in Israel and an active participant in the international community of the KM Pioneers. Edna's company is also a leader in the area of Intellectual Capital management, and created one of the first national IC reports. Edna earned her Ph.D at New York University in Communication Arts and Sciences and has served as faculty member at Adelphi University, the City University of New York, the Hebrew University in Jerusalem and the Tel-Aviv University.

Dr. Ron Dvir obtained a PhD. in Intellectual Capital from Cranfield University, studied Industrial Engineering at the Technion - Israel Institute of Technology and received Ms.C. In Computer Integrated Manufacturing at Cranfield University, UK. In 1987 He joined Programma, a logistics consultancy firm, to design advanced material handling systems. In the early 90's, Ron worked for ECI Telecom in the area of Total Quality Management. In 1996 he became the first Chief Knowledge officer (CKO) in Israel. In 1999 Ron has founded Innovation Ecology which focuses on the creation of innovation enabling environments such as Future Centers and Innovation engines. He is the author of several professional and academic papers, and co-editor of the book "From Knowledge to Value- Unfolding the Innovation Cube" and the book "Are you Ready to Disrupt It- an illustrated guide to Disruptive Innovation".