Participative processes for sustainable changes in European ATM and enabling methods within the SESAR context

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Published in:
Proceedings of the 28th Conference of the European Association for Aviation Psychology

2008

Participative processes for sustainable changes in European ATM and enabling methods within the SESAR context

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As outlined in the Definition phase of the SESAR project, fundamental changes are expected in the future European ATM system. The work tasks of about 260.000 people will be directly and intensively affected by the operational changes outlined in the operational concept (Eurocontrol, 2007). The forthcoming changes will include significant alterations in roles and work functions, tasks may be divided, as well as distributed and shared in new and still unidentified ways. Parts of the system will be further automated and new functions and roles will be introduced along with new technology. These changes will be profound and complex, thus it is assumed that change management activities will be required at various levels within ATM organisations at national and local levels, but also between ATM organisations (Eurocontrol, 2007).
Successful methods for managing and facilitating sustainable changes stress the importance of person and relationship-oriented aspects in terms of communication, commitment, leadership, and involvement. The methods integrate the psychosocial and organisational aspects in what is called participation in order to enable a person and relationship-oriented cyclical process from scoping and planning to implementation and evaluation. This paper presents two methods that integrate participation in processes for organisational change and transition. The methods have been successfully applied in the past and should be considered for the future changes foreseen in European ATM, the implementation of Single European Sky (SES), and the SESAR programme.

Change management and safety

Organisational change processes can have a negative impact on safety performance and existing safety cultures. Organisational change has been found to be a contributing factor in major accidents (Hopkins, 2000). Grote (2008) forwards that organisational changes that are apparently unrelated to risk and safety management may in fact be very relevant to the level of process and work safety. Thus, change management must be considered during major organisational changes in assessments of an organisation's risk quality. Social Dialogue is also required at all levels and that all staff categories should be prepared to actively contribute in the change process (Eurocontrol, 2006), acknowledging the relationship between change and safety.

Participation as the way forward

Participation is a Key Performance Area (KPA) in SESAR where it is recognized that an early/timely consultation and interaction between Social Partners at all levels will help to ensure better and sustainable support from affected staff and prevent adverse effects in the longer term (Eurocontrol, 2006). It is therefore essential that participation and involvement of staff and management with the ability to influence decision making become established as a process that leads to commonly supported results. A participative process enables to address issues of concern proactively, to communicate, exchange and share information, views and observations in a positive and interactive approach resulting in solutions and the mitigation of risks and concerns.

Participation increases acceptance, motivation, and commitment (e.g. Yukl, 2006) concerning the necessary changes and provides a better understanding of the problems at hand among European stakeholders.

Invest in work-oriented relationships to optimise organisational outcomes

Participation has no self-fulfilling purpose as a KPA. Participation is a means to reach the key performance indicators (KPIs) set in the e.g. change project. It is a qualitative aspect of the process to obtain the desired KPIs/results. Traditional KPIs, e.g. productivity, efficiency, and profit, are often set

by organisations to measure quality of the process and success of the results. In a wider meaning KPIs could also be set in change projects concerning e.g. safety, change readiness, adaptability, and precision. In the participative approach, traditional leadership perspective needs to be expanded to include not only leader behaviour and their influence on subordinates, but also to include the employees and their influence on the leader and on each other as well. This holistic participative perspective, *medarbetarskap*, holds the individual as the central actor with responsibilities and authorities for its assignments and relationships. Medarbetarskap is shortly described as the quality and maturity level of work-oriented relationships. These relationships, in order to be developing, learning, and productive, are dependent on the participating personnel's technological skills and competences to handle given assignments – called ableness in the theoretical model, and psychological maturity to manage social interactions – called social ability in the theoretical model. Ableness governs the quality and validity of the inputs in a work-related interaction, and social ability governs the collaborative process how to manage the interactions. This is assumed to be important in the ATM and SESAR change-related context since mature and symbiotic medarbetarskap and leadership are indirect determinant factors to the expected KPIs of the change processes.

Looking at the participative processes induced by the methods presented later in this paper, medarbetarskap and leadership are factors that need special attention throughout the change process. Mature relationships (ableness and social ability) enable interactions where the participants provide each other with valid information to make informed decisions. Tools with comparable scales measuring and providing useful input in order to develop a holistic perspective of mature work-oriented relationships within and between staff and management, enhance the possibility to catalyse the overall approach of reaching sustainable changes based on trustful and participative collaboration. 'Leader Effectiveness and Adaptability Description (LEAD)', 'Your Medarbetarskap', 'The Hourglass® model', and the Integrated Operations – Man-Technology-Organisation (IO-MTO) method are examples of such methods and tools classified in the EUROCONTROL Change & Transition Compendium (draft).

Methods that facilitate participation

Two methods that in effective ways have proved successful applying participative processes for organisational changes will here be presented. The methods are: 1) The Hourglass model (Johansson, 2004) that applies a preparatory and inventory bottom-up approach starting from an individual level going to the company level, and an implementing top-down approach going from company level to individual level, and 2) the Integrated Operations – Man-Technology-Organisation method (Drøivoldsmo et.al., 2006), which is a guideline to best practice for functional analysis and allocations involving the staff in the most central parts of the process.

The Hourglass® model

The Hourglass model is a web based tool designed to increase communication and solve interaction problems in organisations and involves the participation of all individuals – e.g. managers, supervisors, air-traffic controllers – affected by change activities in an organisation. The Hourglass model is used to increase motivation, participation, empowerment, and learning among organisational members, facilitate identification of environmental and organisational problems and possibilities, and to make the organisation more effective and competitive. The Hourglass model was developed in the beginning of the eighties in a company with about 750 employees with the intention to understand organisational change processes and increase the quality and effectiveness. The results obtained by working simultaneously top-down with the management team and bottom-up with the supervisors gave rise to radical organisational and training changes increasing the company's competitiveness.

The Hourglass model is based on four theoretical approaches: Argyris' action science theory (Argyris, Putnam & McLain Smith, 1985); Kolb's experiential learning theory (Kolb, Rubin & McIntyre, 1979; Wolfe & Kolb, 1991); Likert's linking-pin model (Likert, 1961; 1967); and Festinger's cognitive dissonance theory (Festinger, 1957). The Hourglass model is summarized in Figure 1 followed by a description.

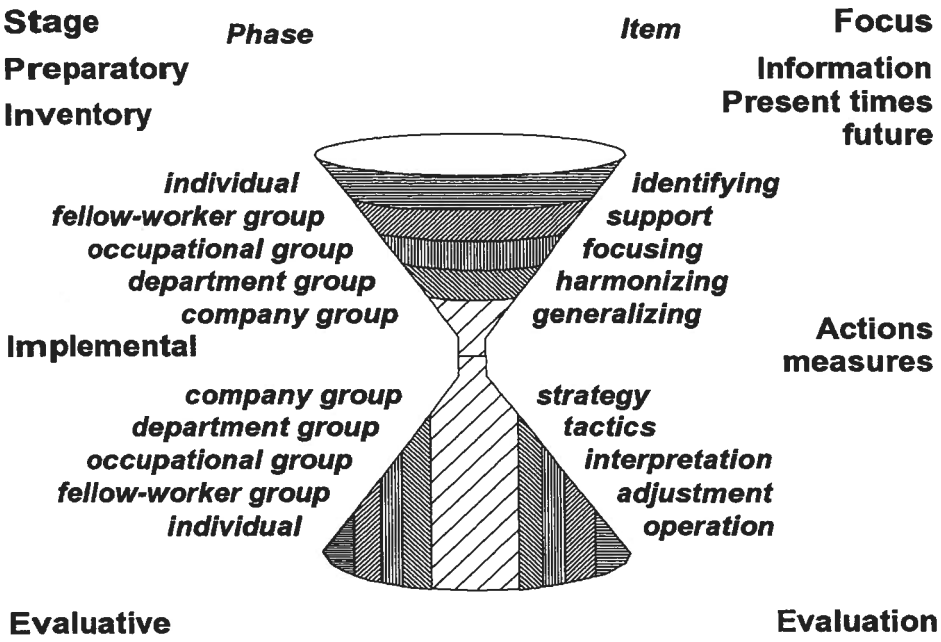

Figure 1. The Hourglass model (Johansson, 2004)

The Hourglass process is conducted in four stages:

- preparatory stage: anchoring the project in the organisation, establishing a project team comprising managers and employees, defining project goals, making a budget and a time schedule for the project
- investigatory stage: identifying environmental and organisational risks, problems, possibilities and future prospects applying a bottom-up approach starting from an individual level and ending at company level
- implemental stage: working out a strategic core plan for actions to be implemented top-down based on the results of the investigatory stage, and making a budget and time schedule for the realization of the strategic plan
- evaluative stage: evaluating outcomes by turning the Hourglass and start a new investigatory stage.

The investigatory and the implemental stages are divided in five phases:

- individual phase aiming at the investigatory stage at personal development in the job as well as operative changes of the job at the implemental stage
- fellow-worker group phase aiming at the investigatory stage at social development as well as changes in collaboration and team work at the implemental stage
- occupational group phase aiming at the investigatory stage at development of professional competence and skills as well as changes in training and supervision at the implemental stage
- department group phase aiming at the investigatory stage at commercial development and increased competitiveness as well as tactical changes at the implemental stage
- company group phase aiming at the investigatory stage at organisational development and strengthening of the company position as well as strategic changes at the implemental stage.

Though the topics to be investigated are decided by the project team, it is the responsibility of the research team or a consultancy team to formulate questions referring to these topics in such a way that the answers uncover dissonance or mental conflicts (Festinger, 1957), hence forcing people to act individually or in groups in order to reduce the tension. Polarizing and "action releasing potentials" are generated by contrasting answers in order to facilitate communication and interaction among participants in later phases of the Hourglass process, and to initiate changes on an individual level and as early as possible in the development of the project.

Examples of how the polarizing technique can be used in the individual phase:

- polarizing with respect to time consumption and priority of work tasks:
  - my five most *time consuming* tasks
  - my five most *important* tasks
- polarizing with respect to present and future time perspectives:
  - the greatest hazards in my work *today*
  - the greatest hazards in my work *in the coming 3-5 years*
- polarizing with respect to frame of reference:
  - information I need to get from my work mates
  - information I have to give to my work mates.

Besides the characteristics of the Hourglass model presented in Figure 1, the model stands out compared to other organisational change methods in the following respects:

- an *interrogative* approach at the investigatory stage is completed by an *imperative* approach at the implemental stage
- a *reactive* attitude to problems and risks is combined with a *proactive* attitude to the development of future individual, organisational and commercial possibilities
- *episodic*, mostly operative, changes at the investigatory stage are integrated with *continuous* strategic, tactical, and operative changes at the implemental stage
- a *divergent* and open approach in the early individual phase of the investigatory stage is combined with a *convergent* and focusing approach in later phases of the investigatory stage and in all phases at the implemental stage
- change and development goals and activities are completely transparent to all participating employees.

The Hourglass model has proven to be very successful in helping organisations to enhance their competiveness and stability while building a more effective organisation in which all employees become motivated and interact in order to fulfil the organisational goals.

Integrated Operations – Man-Technology-Organisation method (IO-MTO)

The IO-MTO method has been developed to facilitate optimal function analysis and allocation in 'integrated operations'. 'Integrated operations' concerns the petroleum industry in the North Sea and the possibilities new technology has provided giving the opportunity to move different types of off-shore operations onshore. This makes it possible to provide more technical support with economical as well as HSE (health, safety, and environment) benefits. The outcome of these technological and thus organisational changes can be substantial social costs and thereby candidates for significant human resistance. However, the IO-MTO method has proven to be very effective in involving the staff in the process and thereby ensuring success for the projects.

The IO-MTO method consists of a series of analyses. The building blocks of the analyses are 'functions' or the activity or role performed towards achieving a goal. Central to the investigation of the possible reallocation of functions is an analysis of the MTO conditions (restrictions and possibilities) required to realise any reorganisation. The validity of the function analysis, the allocation process, and the MTO analyses is assured by the involvement and participation of the staff that is currently performing the analysed functions. The staff is thus a requirement for the most central steps in the method. The IO-MTO method is illustrated in Figure 2.

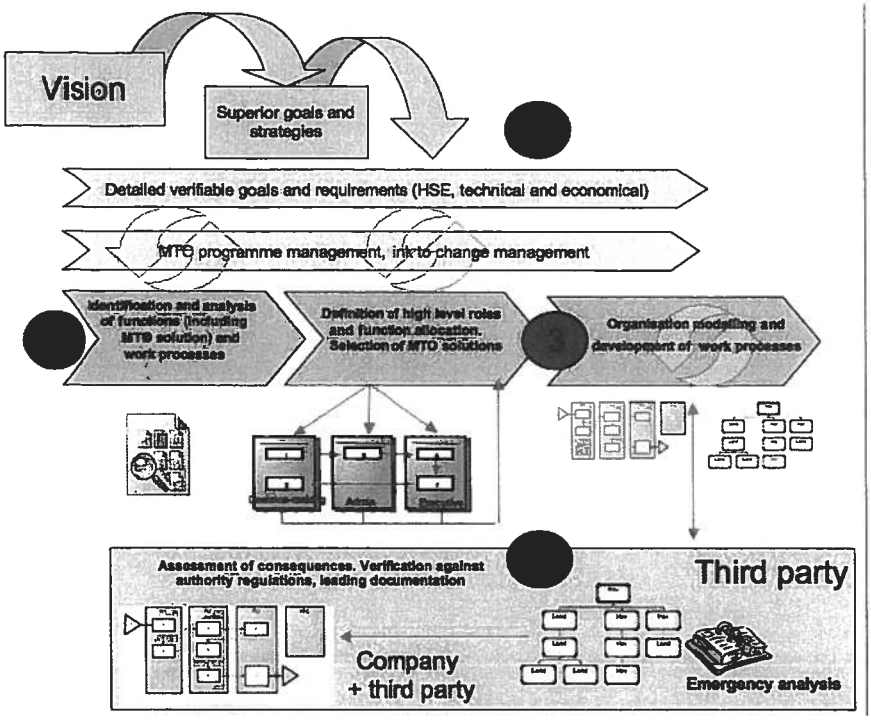

Figure 2. The Integrated Operations – Man-Technology-Organisation method (IO-MTO) (Drøivoldsmo et.al., 2006).

The Goals & Requirements activity runs in parallel with the main phases of the method. Here the organisation's visions and goals for the implementation of integrated operations are identified at several levels in the organisation. The purpose is to make goals and visions concrete, uncover internal inconsistencies e.g. between different levels of the organisation, and identify requirements from other stakeholders like government or unions.

The Function Analysis & Allocation encompasses an analysis of functions within a defined scenario. The analysis starts out by identifying how the existing functions interact with each other. Depending on the strategies to obtain the goals of the project, data, i.e. a description of the current situation that includes human, technology, and organisation, need to be collected. Secondly activities and functions are analysed in terms of constraints and preconditions, and thirdly findings are structured into a matrix that forms the basis for the allocation work.

The design of organisation and work processes phase will ensure that tasks are assigned to each actor in a systematic way. In this phase the "new" organisation is analysed based on the scenarios selected in the previous phase. The new organisation is created from the output of the function analysis & allocation phase and based on the identified preconditions and constraints.

The consequences of the proposed work process models are analysed with respect to e.g. requirements for communication, information, decision-making, and time for response. It is recommended that this part is handled by a neutral third party investigation.

The IO-MTO method has proven very successful in the petroleum industry and has been used at more than ten off-shore oil platforms in the North Sea. When the staff has contributed towards the function- and MTO analysis and the stakeholders locally at the installations (top management of the operations of the platforms off-shore) involve themselves, the success has been granted with the method (Drøivoldsmo, Kvamme, Nystad, Lunde-Hanssen, Larsen & Berge-Leversen, 2007; Holst & Nystad, 2007).

Conclusion

This paper presented two methods that have proved successful applying participative processes for organisational changes. The first method, the Hourglass model, increases communication and solves interaction problems in organisations. The tool increases motivation, participation, empowerment, and learning among organisational members and facilitate the identification of environmental and organisational problems and possibilities. The second method, the IO-MTO method, has been developed to facilitate optimal function analysis and allocation in large organisational change projects. The IO-MTO method has proven to be very effective in involving the staff in the process and thereby ensuring successful outcomes.

The methods have been successfully applied in the past and should be considered for the future changes foreseen in European ATM, the implementation of Single European Sky (SES), and the SESAR programme.

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