

Technology Co-operation and Management Processes

Workshop Outline

Technology co-operation (TC) comprises all efforts by companies, development agencies, and industry associations to jointly enhance technological capability. International development agencies also refer to ‘technical assistance’, as country specific TC. International TC in industry lags behind knowledge management and organizational learning within firms because the international relations context renders communication and participation in TC problematic. This proposed TC workshop fills this gap by addressing social and inter-cultural processes shaping international TC and enabling TC participants to re-organize their joint efforts. The workshop structure is a product of the ethnographic research on World Bank-funded TC (Grammig, 2001). Within a specific industrial sector, knowledge and communication are more interactionist forms of risk, capital and income. Therefore, the analysis starts by soliciting the input of the participating technology experts, reviews current international TC and defines new management tools. Obvious applications are in international joint ventures, development agencies, the parastatal sector, international R&D and multi-national companies. The following research objectives which the TC workshop can address, might correspond to your current management efforts. The list is not complete, but it is indicative of the range of TC issues (within one workshop all can not be addressed).

♦ Potential TC objectives feasible by a workshop

Modifications and/or combination of technological knowledge from/through expert co-operation

Improved technological learning from inter-firm co-operation

Improved adaptation and utilization of foreign technology

Organizational learning approach adapted to the local professional conditions

Context adequacy of know-how from foreign and local experts, transferability of knowledge

Sociocultural and technological specificity of expertise in a professional field

Technological capacity building in firms, professional disciplines and economic sectors

Trust building by combining technological learning and monitoring between firms

Adapting project organization and management tools to industrial policy

♦ Relevant contexts for a workshop

Multi-national companies	International negotiations
University-industry transfer of technology	International joint ventures
Foreign direct investments	Sector investment programmes
Public companies and administrations	Development co-operation

Comparison of production systems, supply chain management, TQM, global outsourcing
Industrial co-operation such as “bootstrapping” (Sabel 1994) and other forms technological networking, also through professional or production associations, and industrial districts or clusters

♦ Examples of potential results

Conflict and power from professional competence versus social and cultural constituents
Monitoring of project implementation, definition of management tools for specific cultural and technological differences between firms, technologies and countries
Identification of the project dynamics related to discursive exchanges and knowledge transfer
Enhancing innovation within international teams by articulating tacit knowledge
Adjusting organizational structure to the technology transfer dynamics from global to local context
Incentive and performance indicators for project participants, team composition and expert profiles
Feedback mechanisms for project participants, reporting and documentation formats
Definition of social processes shaping technology transfer and expert co-operation
Modes of communication in expert teams, on explicit, implicit and unperceived exchange levels
Up-scaling or down-scaling of TC projects and programmes
Pedagogic approach towards professional groups, human resources development needs assessment
Definition of the differences in tacit rules between involved institutions, corporations and firms

In order to attain these results, workshop participants should include technology experts from all disciplines within a firm and from all firms involved in the TC activity. Most conditions of expert co-operation cannot be described explicitly and the interaction of the participants during the workshop is necessary to expose the tacit routines and prejudices shaping expert interaction during the workshop. Compared to typical ‘knowledge management’ efforts, the TC workshop does not attempt to turn tacit into explicit knowledge, but assumes that tacit knowledge remains tacit. Instead, it assumes that experts are willing to account for the tacitness of their knowledge in their job situation and can jointly engage in an assessment of the effects of this tacitness in international teams and projects.

The workshop is most effective during an on-going TC project but serves also to prepare a new activity or evaluate past ones. It is not necessary to cover all technical fields and issues during the workshop, and the participants automatically draw on all interaction ‘events’ in the immediate past. The length of the workshop depends on the representation of all expert knowledge types

being used amongst the participants. Furthermore, the level of conflict and misunderstanding in the recent TC events determine different open space methods used during the workshop.

♦ Technology Co-operation Workshop Synopsis

Day 1

- Task 1.1: Enumerate issues of TC implementation : which tasks, functions, roles
- Task 1.2: List choices in the near future - technologies, experts, products
- Task 1.3: Presentation of types of knowledge : exercise tacit versus explicit knowledge
- Task 1.4: Discuss examples for tacit contribution, concrete differences between firms
- Task 1.5: Latent Content Process discussion (see process definition below)
challenge participants that they can not explain their tacit differences
example: is the instrumental core of technical knowledge less tacit than sociocultural ends ?
- Task 1.6: Classify the implications of the choices in Task 1.2 according the types of knowledge concerned
- Task 1.7: Review current Terms of Reference for participants

Day 2

- Task 2.1: TC policy paradigms, ISI, export strategy, MNCs; what are the political, economic and social issues relating to the region's position in world markets?
- Task 2.2: Classify the choices in the near future (Task 1.2) according to their contribution to the region's position
- Task 2.3: Latent Exchange Process discussion (see process definition below)
let participants seize that their individual position is one within a subset of contested possibilities, establish the complexity of issues in any perspective on local / global relations
- Task 2.4: Discussion of social learning, industrial relations, can TC shift from an endo or exo-social pattern ? is there a need for coherent local strategy ?
- Task 2.5: Compare content versus exchange experiences in order to establish whether tacit knowledge or individual necessity relates to specific tasks
- Task 2.6: Latent Interface Process discussion (see process definition below)
let participants reconstruct the recent interface changes
- Task 2.7: Get initial feedback from participants on the managerial modifications

♦ Latent Processes: the Conceptual Basis for the Workshop

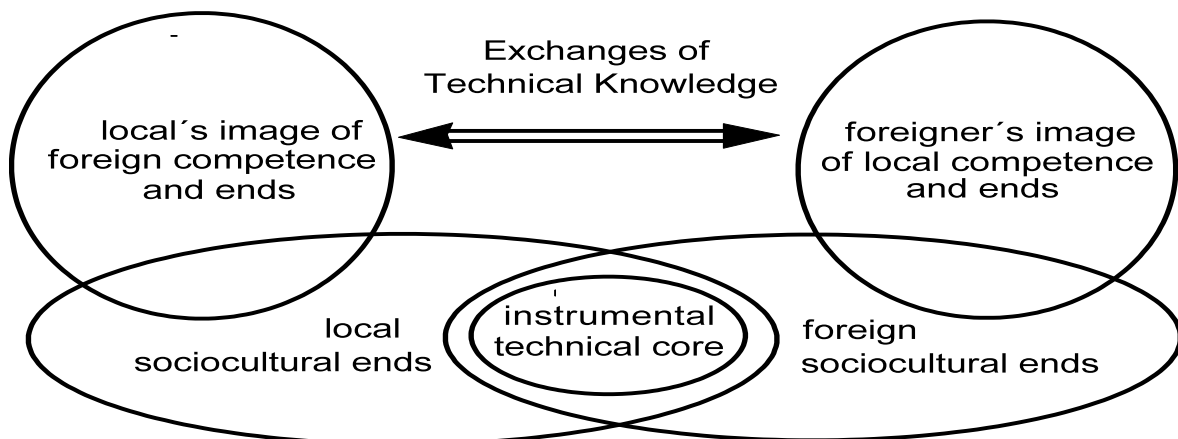
The workshop addresses latent sociocultural processes which shape international TC. These latent processes are the joint product of all participants and contain or reflect their average intercultural skills. These processes are ideal-types, i.e. they are manifest only as local versions of a general process. TC participants frequently have developed their own explanation about these processes (as folk theories) which are operational in their professional context. The workshop offers all participants these ideal-type definitions of latent processes as a basis on which they can enlarge their mutual understanding and make their skills and the limits of their skills more transparent to each other.

In order to provide a lasting improvement of TC activity under study, these latent processes can be translated into TC management tools. These tools allow to optimize all operational aspects of TC with respect to the social, cultural and communicational skills of the particular group of TC participants. Below, a brief explanation of each latent process is presented and afterwards two samples of management tools.

Latent Content Process (Task 1.5)

Origin: experts' tacit knowledge is specific to their professional context, economic sector, firm, organizational culture, due to the difficulty to distinguish between instrumental core and sociocultural ends, which runs counter to experts' professional socialization, intentions to address the core end up responding to the other's image.

Appears: in their exchanges, these differences in tacit knowledge appear as different sociocultural ends where they anticipate the necessity to make unjustifiable claims that ends be part of the instrumental core, declaring cultural images as context independent and instrumental know-how becomes a vicious circle.



The schema is appropriate for the exchanges of knowledge in many international TC cases. When technology experts talk to each other, they can not find out whose knowledge is which ellipsis. They intend to address the core but end up responding to the other's image to varying degrees. Repeating this leads to exchanges where experts anticipate the necessity to make unjustifiable claims that ends be part of the instrumental core. This is an anticipation that s/he would avoid in his/her original professional environment. This repetition can become a process central to the implementation of TC. Declaring cultural images as context independent and instrumental know-how often becomes a vicious circle.

As an abstraction, the empirical accuracy of the process is less significant than its theoretical coherence. During implementation the process gives the exchanges amongst TC participants a logical direction. This latent process is caused by the difficulty in distinguishing the instrumental core from the socio-cultural ends of technical knowledge. The process explains the apparent contradiction between local and foreign experts confronted by each others' know-how while at the same time agreeing on each others' accuracy. The more ardently such a process is engaged, the better an encounter reflects what theory predicts. Only when the experts grasp the relativity of socio-cultural ends does this process stop. But their professional training and experience prevents this. This process is thus due to the nature of technical knowledge which explains the process' correspondingly frequent occurrence.

Latent Exchange Process (Task 2.3)

Origin: macro-political, social history, social identity, economics and trade in the 'global village', sociality as a *habitus*, an all-encompassing sociocultural practice.

Appears: modifications of knowledge and artefacts, sector specific, only attainable via the choice of firms and administrations, **endo-social** versus **exo-social** exchanges.

TC participants can not only rely on their technical skills. When they are working in international TC, they necessarily mobilize their communication skills which are even shaped by their secondary socialization. Thereby they appear in TC not only as experts but also as individuals with their private lives and their wider interpretation of social and political issues. Their behaviour in international TC contains interpretations of their vision of globalization and of

international political issues. In almost all TC cases, technical knowledge is used in a manner that reflects an expert's professional orientation in his/her social context. In TC, an exchange pattern contains technical knowledge and professional orientation at the same time:

the content of the exchanges (knowledge) is dependent on mutual recognition of professional orientation, between foreigners and locals the contrast is of symmetrical inversion, "consumption of modernity *versus* production of tradition, other-centred *versus* self-centred" (Friedman 1994:113).

exo-social: the intrinsic properties of technical knowledge do not shape the exchange between experts, applying knowledge can reduce sociocultural content and change the relations amongst experts, individual differences are possible but affirming them involves considerable risk for the individual, the mobilized know-how is unstable because the other-centred behaviour leads participants frequently to hide individual insights, strategic behaviour is interpreted as normal state of affairs.

endo-social: no possibility to label knowledge local or foreign and thus relations can not be changed through knowledge and skill exchanges, personal differences are sought but are impossible often because self-centred behaviour prevents the re-assessment of cultural stereotypes, context know-how is deficient because the intrinsic properties of technical knowledge appear and experts fail to adapt them sufficiently to local conditions.

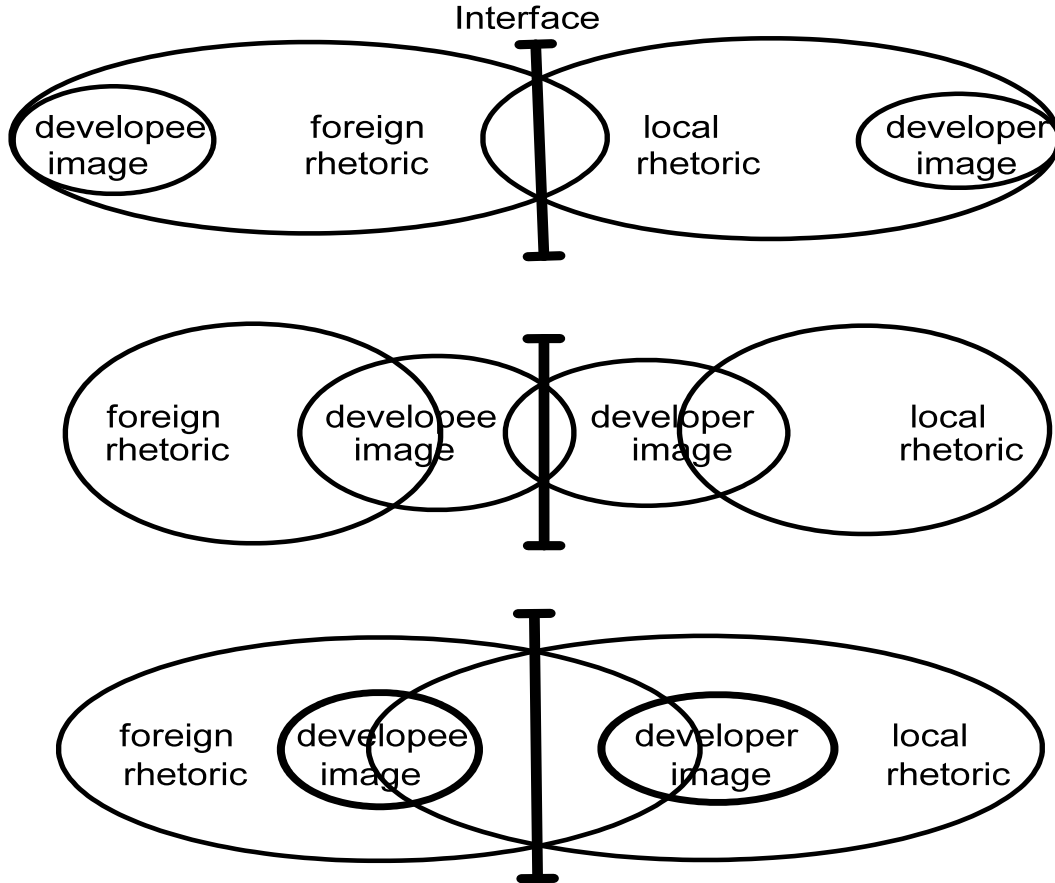
Latent Interface Process (Task 2.6)

Origin: stabilized misunderstandings, due to the attempts to act upon the expert interaction.

Appears: folk theories about the other group, 3 examples of possible interface configurations are presented below: the interface is an interactive filter for claims about the mutual relations, shifts in rhetoric indicate the position of the interface, foreign rhetoric comprise foreigners' verbal efforts to express themselves (vice versa local experts), developer (developer) image is within one rhetoric repertoire when aspects of that image can be pronounced, developer (developer) image is partly outside the rhetoric repertoire when parts of this image are too violent to pronounce them.

Locals (foreigners) never fully understand how a local expert expresses his/her developer (developer) self-understanding, these images change, align, evolve without them realizing

how this occurs. These configurations allow to define potential changes in the cooperation between foreign and local experts.



♦ Possible Management Process Modifications

These three latent processes are ideal-types which are manifest in a specific configuration in each TC activity. They are interactionnal constructs, upheld through constant efforts by the experts to understand their relations and advance the common TC objectives. Once the three processes are defined in a specific case, they can be used to assess and shape all operational aspects of TC, the roles, functions, responsibilities and specializations of the individuals involved, how their tasks are divided, who documents and controls and how the products are assessed and so on. In other words, the three latent processes allow to *align* the structure of the TC activity with the social and cultural orientations of the participants.

To illustrate this alignment, the two lists below represent a sample of operational modifications which reflect the social and cultural orientations of two TC teams which have been studied in the past. The first list reflects a team with exceptionally large cultural differences, where simple means of economic incentives are not applicable.

Category of Tools to Shift Cultural Distance away from Technical Knowledge, for Exo-social Co-operation:

Differentiation of non-essential aspects related to foreign and local participants and of personal concerns such as working hours, clothing, transport, food, and so on.

Separate meetings of local and foreign experts with elaboration of a common agenda for both, while accepting only combined reports as official documents.

Horizontal structure of tasks, where foreign output is also local input and vice versa.

Integrated documentation of expert performance and other reporting arrangements

Budgeting and milestones in implementation defined as simply as possible, ideally with standardised parameters maintained from beginning to the end of the project.

Defining simple quality control parameters recurrently and in writing, distributing auxiliary data and intermediate calculations.

The second example comes from a TC team where cultural differences are evident, but where the educational and political systems in the two countries concerned are quite similar. Accordingly economic incentives are feasible but they remain a crude and inefficient means to assure a TC's performance.

Category of Tools to Mark Tacitness and especially its Local Origin, for Endo-social Co-operation:

Non-essential aspects of participant conditions varied individually.

Technology products specified separately for each group when suitable.

Organizational differences marked relative to objects, specific schedules for different applications or examples.

Separate meetings for foreign and local experts, with each group documenting the changing agenda over project period, some of these documents becoming official documents.

Data gathering and administration initiated discretionary and non-standard.

Vertical structure of tasks, where foreigners perform one application and local experts another; tasks are chosen based on differences in skills needed and available amongst the experts.

Emphasis on informal communication between experts, sharing of resources with resources remaining connected to individual experts.

Resolving role conflicts amongst the experts through requiring compromise, yet not avoiding competition.

These management tool categories allow to influence the implementation of TC because all operational aspects are defined in an integrated assessment. They account for the national cultural context in relation to the learning ability of the individuals involved. A set of tools is applicable in similar co-operation contexts. The coherence of the tools listed is specific to TC activities in a particular sector and when new firms or other countries are represented their coherence is reduced. As such, the latent processes underlying these tools correspond to the social and cultural invariants of TC. These processes are higher order variables than single cultural factors in countries or firms. Instead of separating values or preferences of individuals, they maintain the *imbroglio* between the individuals and the technical knowledge they mobilize. Managing TC requires understanding all forms of knowledge and the individuals in a holistic analysis.

The workshop produces such categories together with the individuals involved, thereby increasing their acceptance. However, these management tools require an ex post assessment of the workshop itself and while some of the management tools are discussed at the end of Day 2, the final list of operational modifications will be different. These can be further discussed and subsequently modified, however in general this can only improve their acceptance but not their quality. The workshop participants themselves are not able to further the re-definition of the TC operation as it happens during the workshop. In all likelihood, the workshop itself produces a shift in the latent processes and the new configuration will remain for a longer period of time.

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