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Knowledge Management Mechanisms In Programmes

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1. Introduction

Since projects provide “more flexible and task specific allocation of resources”, companies use projects as a primary way of doing work. As a result, several projects are now concurrently and sequentially being managed in what has been recognized as multi-project or project-based organizations (Landaeta, 2008).

Traditionally, the vast majority of practical and theoretical developments on project management have been related to single projects managed in isolation (Evaristo and van Fenema, 1999).

Over time, however, issues have arisen where multiple projects are undertaken within organizations, including lack of co-ordination and confusion over responsibility for managing multiple demands on staff (Lycett et al., 2004).

There has been an increasing awareness of the requirement for a new perspective on the management of projects, distinct from that applied in a single project context (Payne et al., 1995). In this context, the foundations have been laid for a new discipline, commonly referred to as programme management.

Program management is defined as the integration and management of a group of related projects with the intent of achieving benefits that would not be realized if they were managed independently (Lycett et al., 2004).

Some authors argue that programme management provides a means to bridge the gap between project delivery and organizational strategy (Lycett et al., 2004).

While there has been an increasing recognition in the literature about diversity of different types of programmes, little guidance is offered in terms of the necessary difference in managing approaches for different programmes (Lycett et al., 2004), especially in the area of learning and knowledge management.

Although knowledge management has been recognized as a critical success factor in programme management, very little research has been conducted to date (Owen, 2008).

This chapter aims to examine the determinant role of programme dimensions onto knowledge management mechanisms.

The research proposes a new framework for classifying different KM mechanisms in programmes and makes propositions about how the size, geographical concentration and task nature of programs affect the portfolio of mechanisms suitable for each program.

Most prior studies tend to examine one dimension of knowledge management mechanisms – personalization versus codification. In this chapter, personalized versus codified, generalized versus specialized and IT-based versus non IT-based are highlighted as three distinct dimensions of KM mechanisms.

The framework and its propositions are based on a literature review and analysis. Moreover, the results of the empirical case study of “Iran Tax Administration Reform & Automation” (TARA) employed to evaluate the research propositions. The “State Tax Organization of Iran” is undertaking the TARA programme aimed at improving its effectiveness and efficiency. The primary focus of this programme is the design and development of an “Integrated Tax System”, that is one of the most important national software systems in Iran, with the goal of developing and improving the existing tax administration and collections process, as well as implementation of a fully integrated technology solution to manage taxpayer information and automate manual processes.

The chapter gives valuable guidance to scholars and managers about the kinds of dimensions that should be considered in order to have successful knowledge management mechanisms in programmes and adds originality to the chapter.

2. Programme Management

Nowadays, modern organizations are increasingly using project-based structures to become more flexible, adaptive and customer-oriented. Programmes and projects deliver benefits to organizations by enhancing current or developing new capabilities for the organization to use. A benefit is an outcome of actions and behaviors that provides utility to stakeholders. Benefits are gained by initiating projects and programmes that invest in the organization’s future (PMI, 2006).

Turner defines a project as an endeavor in which human, material and financial resources are organized in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives (Evaristo and van Fenema, 1999).

Contrary to project management, which is a concept that is clearly understood by both academics and practitioners, programme management seems to be a term that has not reached this maturity yet (Vereecke et al., 2003). The ambiguity surrounding the nature and practice of programme management remains despite well over a decade of academic and practitioner interest (Pellegrinelli et al, 2007). Recent articles stress the difference between project and programme management, but do neither show consensus nor precise definitions of programme management (Artto et al., 2009).

In the literature, many definitions of programme management have been given, ranging from the management of a collection of projects to the management of change (Vereecke et al., 2003).

Some authors associate programmes with large projects. They argue that any project lasting longer than 2 years should be called a programme. Other authors associate it to multi-project co-ordination or portfolio management, which is often related to resource management (Thiry, 2002).

Programme management is now a widely used approach for bringing about planned change. The approach is used to implement strategy, to develop and maintain new

capabilities, to manage complex information systems implementations and many other business changes (Pellegrinelli et al, 2007).

Today, the rationale of programme management lies in strategic management rather than the technical level; the focus is on the organization rather than the team and instead of talking about deliverables, one talk about benefits. In addition, the programme environment is complex: there are multiple stakeholders with differing and often conflicting needs, emergent inputs are always affecting the process, and ambiguity is high (Thiry, 2004).

The object of programmes is the change of a permanent organization. With projects, the permanent organization is usually a given factor that dictates criteria and enablers for project success. Therefore, projects represent narrowly defined task entities or temporary organization (Artto et al., 2009).

3. Knowledge Management

The concept that profoundly has affected the discipline of management in recent years is the idea of knowledge as the most critical ingredient in recipes for organizational success.

Knowledge management might be a popular challenge to today's organizations, but successful firms and their managers have always realized its value. As Drucker (1995) rightfully predicts, knowledge has become the key economic resource and a dominant source of competitive advantage (Chong, 2006).

Davenport and Prusak (1998) defined knowledge as "a fluid mix of framed experience, value, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information (Ma et al., 2008). It originates and is applied in the minds of the knower. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, process, practices, and norms. Knowledge results from the interaction of someone's insights (past experience, intuition and attitude), information and imagination (generating ideas and visualizing futures).

Knowledge if properly utilized and leveraged can drive organizations to become more innovative, competitive, and sustainable. Today, more and more companies are looking for ways to improve and increase their rate of knowledge creation and sharing. In these days organizational processes have become more complex and knowledge intense, and therefore require more awareness and capability in the area of knowledge management.

Knowledge management is the active management of creating, disseminating, and applying knowledge to strategic ends (Berdrow and Lane, 2003). The function of knowledge management is to allow an organization to leverage its information resources and knowledge assets by remembering and applying experience (Boh, 2007).

In general, KM must be seen as a strategy to manage organizational knowledge assets to support management decision making, to enhance competitiveness, and to increase capacity for creativity and innovation (Nunes et al, 2006).

APQC defines KM as an emerging set of strategies and approaches to create, safeguard, and use knowledge assets (including people and information), which allow knowledge to flow to the right people at the right time so they can apply these assets to create more value for the enterprise.

Hence, Knowledge, and consequently its management, is currently being touted as the basis of future economic competitiveness.

4. The Conceptual Framework

Organizing work by projects & programmes allow organizations to respond flexibly to changing organizational needs, but project-based environments face significant challenges in promoting organization-wide learning.

While it is a misconception to think that there is no learning across projects since there are little commonalities across projects, the challenges in facilitating knowledge sharing across projects are well-recognized (Boh, 2007). The management, reuse and transfer of knowledge can improve project and programme management capabilities resulting in continuous learning.

In this chapter, three aspects of knowledge management are considered: knowledge management strategy, knowledge strategy and information technology strategy. Based on these aspects of knowledge management, the proposed framework highlighted three dimensions of knowledge management mechanisms in programmes: personalized versus codified (knowledge management strategy), generalized versus specialized (knowledge strategy) and IT-based versus non IT-based (information technology strategy). The interaction between these dimensions results in a framework that generates eight classes of knowledge management mechanisms.

Knowledge management mechanisms are defined as the formal and informal mechanisms for sharing, integrating, interpreting and applying know-what, know-how, and know-why embedded in individuals, groups and other source of knowledge.

The whole programme must share a common KM orientation. KM strategy describes the overall approach a programme intends to take in order to align its knowledge resources and capabilities to its business strategy, thus reducing the knowledge gap existing between what a programme must know to perform its strategy and what it does know.

It is important to note that if an effective knowledge management strategy is not developed and managed by a programme, valuable intellectual capital can be lost, causing rework and loss of opportunities. Better identification, transfer and management of knowledge allows intellectual capital to be effectively retained within the programme, allowing it to be reused on other projects, reducing the time staff spend recreating what has already been learned (Owen, 2008).

One of the typologies of knowledge strategy has become the most supported and referenced one. This typology recognizes two different knowledge management strategies for sharing tacit and explicit knowledge: codification and personalization (Venkitachalam and Gibbs, 2004).

Codification strategy involves securing knowledge then storing it in databases for others to access and reuse. The knowledge is independent of the person who initially created it (smith, 2004). Codification can be a good mechanism to store large amounts of knowledge and to create an organizational memory for all employees (Boh, 2007). Codification strategy focuses on codifying knowledge using a “people-to-document” approach.

On the other hand, personalization is a strategy to manage the knowledge that is produced by human interaction. This knowledge is difficult to codify and store because it is unable to replicate the human qualities used when resolving an issue (smith, 2004). Personalization strategy focuses on dialogue between individuals, not knowledge objects in a database. It is a person-to-person approach where the shared knowledge is not only face-to-face, but also electronic communications.

Codification mechanisms typically do not provide a rich medium for communication. Personalization, on the other hand, provides a rich medium for communication, as it is concerned with the use of people as a mechanism for sharing knowledge (Boh, 2007).

Programmes should not attempt to implement both strategies. Rather, they should use one strategy primarily and use the second strategy to support the first.

Some authors argued that you need to start by identifying what kind of organization you have and what your information needs are, and then primarily focus either on a personalization or a codification strategy (Greiner et al., 2007)

In a small programme, personalized mechanisms may serve the knowledge management needs of the programme adequately as employees frequently meet each other in the hallways or at meetings. In a large programme, it is a challenge to find ways of making the connections between individuals who have the right knowledge to share with one another. The probability of serendipitous encounters drops drastically (Boh, 2007). Hence, the first research proposition is:

“Codified mechanisms are more suitable for large programmes; while personalized mechanisms are more suitable for small programmes”.

A suitable knowledge strategy should answer to the important question: ‘What knowledge is important to your programme?’ While knowledge strategy deals with identifying important knowledge, knowledge management strategy deals with implementing knowledge initiatives to close knowledge gap.

According to knowledge strategy, two types of knowledge have been identified in the field of programmes: programme management knowledge and programme domain knowledge.

Based on this aspect of knowledge, the proposed framework is highlighted the second dimension of knowledge management mechanisms in programmes: generalized versus specialized mechanisms.

“Programme Management Knowledge” is the sum of knowledge within the profession of programme management which includes proven traditional practices that are widely applied, as well as innovative practices and published and unpublished material.

This type of knowledge, which can be labelled kernel (Leseure and Brookes, 2004), includes forms of knowledge that need to remain and be nurtured within a company in order to sustain high programme performance in the long term. Because kernel knowledge is what allows programmes teams to repeatedly complete independent programmes in the long term, it matches the accounting definition of intangible assets.

“Programme Domain Knowledge” is the knowledge about programme domain (e.g., general business, industry, company, product, and technical knowledge) of an application area in use during the project. This type of knowledge is called application area-specific knowledge in the (PMI, 2006).

This knowledge is useful for one programme, but has a low probability of ever being used again. This form of knowledge, which is also labelled ephemeral knowledge according Leseure and Brookes (2004), is only active and useful during the life time of a programme. Ephemeral knowledge does not match the definition of intangible assets as there is no evidence that it will be useful again in the future.

If a programme provides a standardized and routine solution to its client, generalized mechanisms would leverage the ability to create and reuse the programme management knowledge in order to sustain high programme performance in the long term. On the other hand, programmes tend to tackle problems that do not have clear solutions at the outset;

benefit more from specialized mechanisms, which allow them to create or absorb programme domain knowledge in order to gain better understanding about the problem and its potential solutions. Specialization strategy increases the probability of unique programmes success by supplying critical domain knowledge to them. Hence, the second research proposition is:

“Generalized mechanisms are more suitable for programmes conducting projects that are more standardized and routine in nature; while specialized mechanisms are more suitable for programmes conducting projects that are more unique in nature”.

Another key dimension in the proposed framework is information technology strategy. This label encompasses both the differentiations between IT-based versus non IT-based mechanisms.

The main IT-based mechanisms are, decision support technologies, groupware, electronic knowledge bases and main non IT-based mechanisms are, spontaneous knowledge transfer initiatives, mentoring, teams and communities of practice.

It is important to know that a firm must take a global and consistent vision when managing its knowledge and selecting the KM tools to be implemented.

The key to achieving harmony between KM and IT is to understand the very basic principle: there are things that computer and technology do well, and there are things that humans do well (Egbu and Botterill, 2002). Many of the failures of IT and KM are the result of repeated attempts to force one paradigm to operate within the realm of the other.

Although a recent study from the “American Productivity and Quality Center” shows that organizations embarking in knowledge management efforts generally rely, for accomplishing their goals, on the setting up of a suitable IT infrastructure (Mohamed et al., 2006), many investigators insisted that knowledge management initiatives could be successful without using IT tools, and IT should be adopted only when it is necessary (Egbu and Botterill, 2002).

Dougherty (1999) argues that IT should be seen as a tool to assist the process of KM in organizations. Such a process relies more on the face-to-face interaction of people than on static reports and databases (Duffy, 2000). Others argue that IT is strategically essential for global reach when organizations are geographically distributed because of increasingly difficulties for them to know where their best knowledge is and to know what they know (Magnier-Watanabe and Senoo, 2008).

IT can assist teams, who in today's world may meet only occasionally or even never, to share experiences on line in order to be able to build and share knowledge, and more generally to work effectively together. If properly used, IT can accelerate knowledge management capabilities in both time and space dimensions. Locality, timing, and relevancy factors determine the expediency and the strength of IT role in KM initiatives (Egbu and Botterill, 2002).

It should be mentioned again that IT cannot be considered the magic bullet that makes a KM initiative a complete success. So, IT has to be part of a balanced and integrated set of components. Hence we propose that:

Programme Dimensions	KM Mechanisms
Large-Sized, Routine Task Nature, Geographically Dispersed	Codified, Generalized, IT-Based
Large-Sized, Routine Task Nature, Geographically Concentrated	Codified, Generalized, Non IT-Based
Large-Sized, Innovative Task Nature, Geographically Concentrated	Codified, specialized, Non IT-Based
Large-Sized, Innovative Task Nature, Geographically Dispersed	Codified, specialized, IT-Based
Small-Sized, Routine Task Nature, Geographically Dispersed	Personalized, Generalized, IT-Based
Small-Sized, Routine Task Nature, Geographically Concentrated	Personalized, Generalized, Non IT-Based
Small-Sized, Innovative Task Nature, Geographically Concentrated	Personalized, specialized, Non IT-Based
Small-Sized, Innovative Task Nature, Geographically Dispersed	Personalized, specialized, IT-Based

Table 1.Proposed KM Mechanisms Based on Types of Programmes

“IT-based mechanisms are more suitable for programmes that are geographically dispersed; while non IT-based mechanisms are more suitable for programmes that are geographically concentrated”.

The interaction between three dimensions of programmes knowledge management mechanisms results in a framework that generates eight classes of KM strategies (Table. 1 depicts the research propositions which are based on types of programmes).

5. The Case Study Results

During the three years of launching TARA programme, the PMO has remained relatively small with a total of about 40 employees. All of these employees have collocated in the

three-floor building. Over 80% of the employees have at least master degrees and the average age of them is about 35 years old.

Generalized		Specialized		Knowledge Strategy
Non IT-based	IT-based	Non IT-based	IT-based	IT Strategy / KM Strategy
• Written work procedures • Programme Management Books	• DSS of Contractor Selection • Database of Programme Management Articles • E-Books	• Programme Monthly Reports • Projects Status Reports	• Programme Portal • Email • Document Management System	Codified
• Programme Management Seminar • PMO Committees • Coaching		• Coaching • Meeting with Advisors • PMO Weekly meeting • Meeting with Contractors • PMO Units Meeting • Projects Coordination Meeting • Socialization of new employee • Experts consultancy	• Net Meeting Software	Personalized

Table 2.TARA Identified Mechanisms in the KM Mechanisms Matrix

TARA programme includes diverse projects which are unique and complex in their nature. Projects like: “Integrated Tax System”, “Risk-Based Audit Selection”, “Data Center Implementation” and “Tax Evasion Study and Prevention Plan” are some of these projects. There is serious lack of knowledge and experiences regarding these projects in Iran. Some interviewees highlighted that collecting an acceptable level of knowledge for defining the scope and deliverables of the projects is one of the most important success factors of the programme. Therefore the programme nature is characterized as very unstructured and non-routine.

As shown in the table.2, the case study results highlighted that the key mechanisms used for knowledge management in the TARA programme are more personalized, non IT-based mechanisms predominantly oriented towards specialization. Whereas TARA is a small,

concentrated and innovative programme, the findings support the research propositions. Many interviewees mentioned that they used oral communications to find right individuals to approach for knowledge sharing. Many individuals in the programme depend on their personal network to find the answers to their questions, or to identify the right people to speak to.

Senior staffs that have been in the PMO for a long period of time and would know things from long ago are key sources of referrals and knowledge in TARA programme.

It was mentioned by interviewees that it was not difficult to find information when someone is looking for specific information, but they do not necessarily know what types of knowledge and information is available to them in the course of their work. Some employees highlighted that they often found out after the fact that their work would have been facilitated if they had approached so-and-so for help before they started.

The programme does not use of many collaboration technologies to enable individuals to share information and knowledge with others. The main mode of knowledge and information sharing in the PMO is through diverse meetings such as: Projects integration meetings, meetings with advisors, PMO weekly meetings, meetings with contractors and PMO Units Meetings.

Document management system is the most important codified, IT-based mechanism in the programme. The mechanism is a computer system used to track and store electronic documents and images of paper documents. This web based electronic document management system provides a central repository to access, create, store, modify, review, and approve documents in a controlled manner.

The results of case study also highlighted that PMO has been used more knowledge management mechanisms for gaining and sharing programme domain knowledge than programme management knowledge. It means that the content of the projects are more challenging for the PMO staffs than the context of managing the projects.

6. Discussion

The objective of the research has been to create a better understanding of Knowledge management in programmes. The literature defines programme management as the integration and management of a group of related projects with the intent of achieving benefits that would not be realized if they were managed independently.

The case study shows the usefulness of the framework in evaluating the use of Knowledge management mechanisms, and in analyzing the fit of the mechanisms with programme dimensions. The case study results highlight that knowledge management does not necessarily mean having to codify all individual employees' knowledge. Instead, another key approach to retain and share knowledge is by ensuring that the knowledge is shared with and diffused amongst other employees in the programme.

According to the findings, the authors don't agree with some arguments in the literature about the important role of information technology to leverage knowledge management. As the research has shown, most of the mechanisms identified by participants are social in nature; therefore, this case study confirms the view that knowledge management is a social rather than a technical process.

One of the successful mechanisms which are used in this regard is consulting with experts as knowledge providers. Based on Boh (2007), this mechanism has several advantages. First,

the experts can provide customized advice for each project for which they are approached. Second, given the years of experience that these experts have accumulated, they have a wide network of contacts to draw upon. Hence, they can effectively broker knowledge linkages between problems owners to other consultants with potential solutions. Third, the experts themselves can benefit from accumulating experience in repeatedly searching for information from their contacts and archives, such that they build up an extensive mental model of who knows what as well as a large set of archives developed from previous interactions with their own client-consultants.

One of the finding doesn't support the proposition of Boh (2007). He proposed that codification knowledge sharing mechanisms are more suitable for organizations conducting tasks that are more standardized and routine in nature; while personalization mechanisms are more suitable for organizations encountering problems that are more unique in nature. It is important to note that the context of his work (project based organizations) is different from this research's context (programme environment).

As a single-site case study, which was investigated only one programme; the study does not permit the extrapolation of the results to a larger population. So, the multiple case study approach can be adopted as a suitable strategy for future research in this regard. It will also remain for future research to refine and expand the proposed framework. Whereas culture might play a role in the programme management approach and style, Comparison of the conclusions with observations in programmes in other countries is necessary to improve the external validity of the research.

7. Conclusion

As a result of the research effort, the conceptual framework of knowledge management mechanisms in programme was established. The research shows that different types of programmes require different knowledge management mechanisms. This chapter, however, distinguishes between codified versus personalized, generalized versus specialized and IT-base versus non IT-based as three distinct dimensions. Prior studies tend to examine only one dimension of knowledge management mechanisms: codification versus personalization.

The framework proposes that codified mechanisms are more suitable for large programmes; while personalization is more suitable for small programmes.

This chapter proposes that generalized mechanisms are more suitable for programmes conducting projects that are more standardized and routine in nature; while specialized mechanisms is more suitable for programmes conducting projects that are more unique in nature.

The framework also proposes that IT-based mechanisms are more suitable for geographically dispersed programmes; while personalized mechanisms is more suitable for geographically concentrated programmes.

The chapter is the pioneer of its kind to examine if there are suitable configurations of KM strategies for programmes with different dimensions. It gives valuable information, which hopefully will help programmes to accomplish knowledge management.

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This book, edited by the Intech committee, combines several hotly debated topics in science, engineering, medicine, information technology, environment, economics and management, and provides a scholarly contribution to its further development. In view of the topical importance of, and the great emphasis placed by the emerging needs of the changing world, it was decided to have this special book publication comprise thirty six chapters which focus on multi-disciplinary and inter-disciplinary topics. The inter-disciplinary works were limited in their capacity so a more coherent and constructive alternative was needed. Our expectation is that this book will help fill this gap because it has crossed the disciplinary divide to incorporate contributions from scientists and other specialists. The Intech committee hopes that its book chapters, journal articles, and other activities will help increase knowledge across disciplines and around the world. To that end the committee invites readers to contribute ideas on how best this objective could be accomplished.

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