Defining Leadership as Process Reference Model: translating organizational goals into practice using a structured leadership approach

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Abstract. Effective leadership in organisations is important to the achievement of organizational objectives. Yet leadership is widely seen as a quality that individuals innately possess, and which cannot be learned. This paper makes two assertions; (a) that leadership is a skill that not only *can* be learned, but which can be formalized into a Process Reference Model that is intelligible to practitioners and be understood from an Enterprise Architecture perspective, and (b) that Process Reference Models in the strict sense can be redefined to include a new category of PRM called provisionally a Reference Model of Organisational Behavior, a new category of PRM which focuses on organisational behavior in pursuits of goals.

Keywords: leadership, complex teams, virtual teams, process reference model, process assessment model.

1 Introduction

Enterprise Architecture can be thought of as an *informing principle* that enables the translation of an organisation's high-level aspirations into the structures and processes that are designed to realise these aspirations [1]. This includes the technological infrastructure and associated data that allows the enterprise to function. No less important to the realisation of the enterprises' goals is the exercise of leadership at various levels within the organisation.

Indispensable as leadership is to high-performance enterprises, there is still no commonly agreed definition of leadership [2], much less a meaningful definition of leadership in process terms that can be used to facilitate more effective leadership in a process-driven enterprise. This paper describes a Process Reference Model for the leadership of complex virtual teams with which an enterprise might better facilitate the translation of those high-level aspirations into concrete reality.

A Leadership Process Reference Model is arguably consistent with the generalized view of Enterprise Architecture as concerning itself with describing in a formal, structured way the relationships between the elements (including people and

technology) of an organisation in such a way that they can manage on-going change and achieve their goals [3].

This paper discusses a Process Reference Model developed for use in the Software Engineering domain. To qualify for the name, a PRM must conform to certain prescribed criteria (that it be developed in conformance with ISO/IEC 15504 and ISO/IEC 24774). The PRM discussed in this paper does conform to these standards. A second issue for discussion is that of whether leadership is something that can even be described in a Process Reference Model.

It is important to note that the results of preliminary trials suggest that the Leadership PRM might well be applicable to other domains besides Software Engineering. There is nothing in the model that ties it specifically to the SE domain. Rather, it identifies the underlying leadership principles that must be present if leadership is to be manifested in a given situation. The form in which leadership is expressed will vary according to the circumstances, hence the lack of consensus on how to define leadership [2]. This paper argues that while the Leadership PRM conforms to the standard definition of a PRM, its focus on organizational behavior suggests it might best be classified as a new category of PRM, provisionally called a Reference Model of Organisational Behavior (RMOB).

2   Process Reference Models in organisations

Process models developed in conformance with ISO/IEC 15504 and ISO/IEC 24774 can arguably be called a Process Reference Model (PRM), particularly when the draft model has had all of its outcomes validated by the existence of artefacts and/or activities identified during multiple review iterations involving practitioners and process model experts. In addition, the model may be used by an external observer to describe the behavior of an effective leader. Combine these factors and a strong argument exists for this position.

But the orthodox view in software engineering sees PRMs as high-level descriptions of what tasks to perform and in what order to perform them in order to achieve desired project outcomes. The focus is on external entities that can be observed and assessed against an objective assessment model.

A difficulty arises though when trying to reconcile the orthodox view of PRMs with a specific PRM focused on the elusive qualities of Leadership. Despite thousands of books and papers written on the topic of leadership over centuries, no commonly agreed definition yet exists [2]. Leadership qualities derive partly from a set of personality factors residing *in* the leader and partly from explicit actions performed *by* the leader at the team and organisational level. While the explicit actions can be directly observed, the implicit qualities cannot be observed, only their effects (as manifested by the attitudes and activities displayed by the leader).

A PRM for the leadership of complex virtual teams describes aspects of desired *organisational* behavior that if performed repeatedly will become institutionalised and which will result in consistently achieving the prescribed purpose (i.e. working towards the achievement of organisational goals). This approach re-focuses attention from conformance to prescribed activities and tasks, to a focus on the *demonstration*

of desired organisational behavior, taking us away from the traditional role of a PRM. And leadership is potentially just one of many desirable organisational behaviors that might be facilitated by a PRM.

How then to reconcile these differences? A logical answer is to conclude that the Leadership PRM is in fact a new category of process reference model, described provisionally as a *Reference Model for Organisational Behavior* (RMOB).

The creation of this new category of PRM and its associated assessment model opens up the field across a diversity of disciplines for others to develop models of organisational behavior covering a range of activities (for example IT governance), giving them the means to assess and improve organisational behavior.

Reference Models for Organisational Behavior (RMOB) therefore represent a significant new application of Process Reference Models and Process Assessment Models in domains outside software, systems engineering and service management. RMOBs have relevance to Enterprise Architecture since they are concerned with formal, structured descriptions of the relationships between the elements (including people and technology) of an organisation, and how these can be used to manage on-going change and achieve organisational goals [3].

3. Can leadership be described as a process?

Leadership behavior is just one of many behaviors engaged in by organisations as they pursue their objectives. If leadership can be described in a Process Reference Model (PRM) and supported by a PAM, then it is significant to note that other behaviors not yet serviced by a PRM might also get the benefit of having a PRM. ISO/IEC 15504 [4] offers organizations the means to develop and assess not just their integrated teaming capability against the measurement framework, but also other organisational behaviors.

We begin by examining whether there are grounds to believe that PRMs are applicable in addressing leadership in a software engineering environment? It will be seen from the discussion that PRMs and Model Based Process Improvement (MBPI) can arguably be applied to a range of software engineering challenges, including the challenge of project leadership.

Figure 1 suggests there are two broad justifying reasons; first that Leadership can be learned by those who would practice it [5] [6] [7]. Second, defined processes are necessary for organisational effectiveness [8]. As Deming said, *if you cannot describe what you are doing as a process, then you don't know what you are doing* [9].
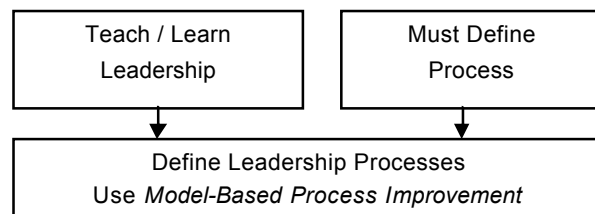
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┌─────────────────┐   ┌─────────────────┐
│  Teach / Learn  │   │   Must Define   │
│   Leadership    │   │     Process     │
└────────┬────────┘   └────────┬────────┘
         │                     │
         ▼                     ▼
┌──────────────────────────────────────┐
│      Define Leadership Processes      │
│   Use Model-Based Process Improvement │
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Figure 1. Model-Based Process Improvement enables definition of leadership processes

The conceptual overview diagram in Figure 2 illustrates the evolution of the question *how can the challenge of more effective virtual team leadership be met?* Assuming that the leadership factors could be identified from a broad literature review, then a Process Reference Model is a logical way for these factors to be formalised and applied in real situations.

The conceptual overview acknowledges the basic distinction between co-located and virtual teams, and that integrated teams can be either. Virtual teams do not have to be integrated but commonly are. Integrated teams do not have to be distributed, but commonly are. Therefore, the characteristics of successful teams and successful leaders are considered for both co-located and virtual teams, culminating in the characteristics of successful leaders of integrated teams operating in virtual environments.
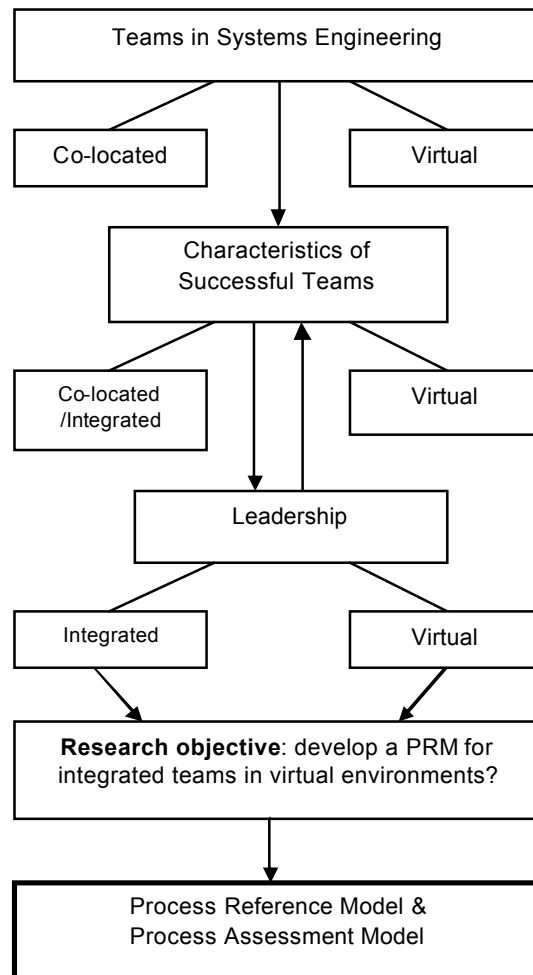

Figure 2. Conceptual overview of how Leadership PRM & PAM evolved

4. Model-Based Process Improvement as a solution to rising organizational complexity

Managing complex enterprises and projects across dispersed geographical locations has never been more difficult, given the rising complexity of the global economic environment and the multi-national corporate entities that now inhabit this world. There is a clear need to find improved ways of managing this often difficult process now and into the future [10].

Model Based Process Improvement (MBPI) potentially offers the means by which organisational challenges such as the leadership of complex virtual teams can be met. MBPI has not (to the knowledge of the author) been previously used to address leadership, though there is arguably a sound basis for thinking that it might be.

MBPI aims generally to improve the performance and maturity of organisational processes. It combines the discipline of process improvement with the several international standards and frameworks now in use (i.e. ISO/IEC 15504, CMMI). Combining this awareness of process performance with internationally recognised standards is advantageous to organisations. It provides a structured and comprehensive framework as a way forward and prescribes in general terms the scope of activities required to systematically improve their process maturity.

Heston and Phifer [11] ascribe the following organisational benefits to MBPI:

- *Improving consistency and repeatability:* consistency and repeatability assist with minimising process variation, a major source of product defects. It also allows project staff to move into and out of projects more easily by having clearly defined roles and responsibilities.
- *Improving communication:* achieved through the adoption of a common vocabulary with clearly prescribed meanings that allows project staff, clients and business partners to communicate with less ambiguity.
- *Enabling more improvement*: process improvement programs create an environment which is conducive to further improvement. Beyond consistency and repeatability comes the ability to measure and record process performance. This performance data can then be used to plan further improvements and to benchmark against best practice.
- *Providing motivation*: objective targets, for example being assessed at a certain level of maturity, become a visible motivator for project staff to maintain their efforts to improve process performance.

5. Leadership PRM in practice

The Leadership PRM was developed using a Design Research approach [14] in which an initial prototype was developed based on the broad literature and reviewed in a series of design iterations over an 18 month period (a total of six reviews). The reviews included the standard PRM-developer's method of practitioner and expert reviewers, plus an ISO/IEC 24774 conformance review to ensure the model met the requirements of that standard. The PRM was also validated with Behavior Engineering [12], a formal method for checking content and syntax for errors and

ambiguities that was developed initially for validating software requirements for complex systems, but which has proven a promising method for validating PRMs [13].

Having passed through these six reviews, the V1.0 PRM was released and reviewed again by a focus group over a full day. The group comprised two practitioner project managers and two experts on process models in software engineering. The terms of reference of this post-release review was to *evaluate the efficacy of the leadership PRM, particularly in relation to (a) fitness for purpose, (b) organisation of and content of elements, and (c) what would make it more usable from a practitioner's point of view?*

As a result of the review, V1.1 PRM was produced. This version incorporated the accumulated feedback from the focus group and resulted in substantial changes by (a) consolidating and merging several processes, (b) reordering the processes to reflect a sequence more naturally performed in projects, and (c) adding additional informative material relevant to virtual and/or integrated project environments. All of these changes were consistent with the review's terms of reference.

Importantly for the purposes of this paper, the consensus opinion of the focus group was that the *Leadership PRM is a usable model.* They each wanted a copy of the update V1.1 PRM for use in their own projects. This feedback lends support to the argument that a Reference Model of Organisational Behavior that conforms to the requirements of a PRM in a software engineering sense can be a useful and usable artefact.

Also emerging from this first post-release review was a *Process Assessment Model* (PAM) based on the Leadership PRM. This PAM was developed in accordance with ISO/IEC 15504-1:2004 Parts 1 and 2,

Table 1. Structure and content of Leadership Process Assessment Model.

Leadership Process Assessment Model	
Individual Process Group (IND)	
IND.1	Vision
IND.2	Objective(s)
IND.3	Integrity
IND.4	Action-orientation
IND.5	Intelligence
IND.6	Individualized consideration
IND.7	Management-by-exception
Team Process Group (TEM)	
TEM.1	Team structure
TEM.2	Team requirements
TEM.3	Team recruitment

TEM.4	Team environment
TEM.5	Team formation
TEM.6	Team roles
TEM.7	Team rules
TEM.8	Team authority
TEM.9	Team performance management
TEM.10	Team development
Organisation Process Group (ORG)	
ORG.1	Team boundaries
ORG.2	Team collaboration
ORG.3	Team & home organization balance

An example process from the PAM (*Vision)* is shown in Table 2 below. It and the other 15 processes have now been elaborated into a draft PAM. The first review established that a PAM which embodies at least the Process dimension is viable.

The second and subsequent reviews (V1.2 onwards) will investigate the feasibility of including the Capability dimension in the Leadership PAM. While it has been established during the validation of the PRM that each of the outcomes can be substantiated by the presence of artefacts and/or activities, it is not yet clear whether the discernable process indicators can be distinguished with sufficient clarity to establish the capability dimension. Only by performing a number of assessments using the draft PAM and accumulating data in the *Work Products / Activities / Conditions* section will we know whether a capability dimension is feasible. This work is on-going.

Table 2. Structure and content of PAM Example 1.

Process ID	IND.1
Process Name:	**Vision**
Process Purpose:	The purpose of the vision process is to create and communicate a shared vision in ways that inspires people to realise that vision.
Process Outcomes:	As a result of successful implementation of the vision process: 1) A vision of the goal(s) is created. 2) The vision of the goal(s) is communicated to team 3) Commitment by team to the shared vision is gained
Base Practices:	**IND.1.BP1: Create the vision**. The leader envisions a desirable future condition [Outcome 1]
	IND.1.BP2: Communicate the vision. The leader communicates the vision in a way that creates positive expectation in the team members [Outcome 2].
	IND.1.BP3: Commitment to vision by team. The leader obtains

	commitment from the team members for the realisation of the vision, making it a shared vision [3].

Work Products / Activities / Conditions

Inputs	Outputs
Business goals [Outcome 1]	Team Charter [Outcome 1]
	Imperative Objectives [Outcome 1]
Customer requirements [Outcome 1]	Project Plan [Outcome 1]

The PAM can be used in three possible ways, (a) by project managers to evaluate their own practice, and engage in self-improvement by benchmarking against best-practice, and (b) by organisations wishing to improve their internal management capability, and (c) theoretically by external agencies wishing to evaluate a potential supplier's management capability (though this would be some distance away since the capability dimension has not been established).

Table 3. Structure and content of PAM Example 2.

Process ID	**IND.2**
Process Name:	**Objectives**
Process Purpose:	The purpose of the objectives process is create and communicate objective(s) based on the vision and derived goals.
Process Outcomes:	As a result of successful implementation of the objectives process: 1) Practical objective(s) for goal(s) achievement are developed. 2) Positive expectation for achieving objective(s) is encouraged.
Base Practices:	**IND.2.BP1: Develop objectives**. The leader derives a set of practically worded objectives from the shared vision and subsequent goals that give the team a concrete set of outcomes to achieve. [Outcome 1]
	IND.2.BP2: Encourage positive expectation. The leader generates an optimistic mind-set and outlook in the team towards the achievement of the objectives [Outcome 2]

Work Products / Activities / Conditions

Inputs	Outputs
Vision statement [Outcome 1]	Goals [Outcome 1]

	Objectives [Outcome 1]
Project plan [Outcome 1]	Goals [Outcome 1]
	Objectives [Outcome 1]
Project launch [Outcome 2]	Positive expectation re vision [Outcome 2]
Team briefing [Outcome 2]	Commitment to vision [Outcome 2]
Yearly kick-off [Outcome 2]	Positive expectation re vision [Outcome 2]
Quarterly review [Outcome 2]	Commitment to vision [Outcome 2]

6. Conclusion

This paper discusses the issue of effective leadership in organisations and argues the case that (a) leadership is a skill that can be learned, and which can be formalized into a Process Reference Model that is intelligible from an Enterprise Architecture perspective, and (b) Process Reference Models in the strict sense can be redefined to include a new category of PRM called provisionally a Reference Model of Organisational Behavior which focuses on organisational behavior in pursuits of goals.

In support of the case that leadership can be learned is the extensive body of work by influential researchers on leadership like Warren Bennis [6] and Peter Drucker [5]. This does not ignore the innate charisma of so-called 'born leaders', but makes the case that leadership can be understood and applied more effectively in a practical sense.

In support of the case that leadership can be described as a process reference model is the work of process pioneer W. Edwards Deming who observed that if you cannot describe what you are doing as a process, you don't really know what you are doing [9]. While the Leadership Process Reference Model conforms to the normative reference, qualifying it to be called a PRM, the broader, more organizationally-focused nature of this model suggests it might be best described as a new category of PRM, provisionally called a *Reference Model for Organisational Behavior*.

A Leadership PRM developed by a rigorous Design Research [14] process and tested in preliminary trials and found to be useful by practitioners and experts is arguably a viable model. Strengthening this position is the draft Process Assessment Model that considers initially the process performance dimension, but which will be elaborated in on-going trials for the inclusion of the capability dimension.

The results so far have been encouraging. Not only is a Leadership PRM & PAM useful its own right, but it also points to the possibility of developing other *Reference Models for Organisational Behavior* and PAMs covering a multitude of organisational behaviors across a range of disciplines, including but not limited to

financial institutions and banks, automotive systems and software, aerospace systems and software, medical device systems and software, IT service management, test process improvement, small and very small enterprises. This would significantly extend the breadth of application of the standardised approach to process modeling and assessment.

From an Enterprise Architecture perspective, a Leadership Process Reference Model and its derived Assessment Model are arguably consistent with a generalized view of Enterprise Architecture as optimized formal descriptions of the elements and relationships (including people and technology) of an organisation in order to achieve their goals [3]. As such they arguably make a worthwhile contribution to the EA domain.

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