Session 5: People in Context

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Abstract

Session 5, entitled “People in Context”, addressed the question of how to understand the role of people in processes by looking at the various contexts in which they operate. The discussion was organized by examining the process model context, the team context, the project context, and the organization context.

Dewayne Perry organized the session by discussion of four different contexts in which to consider people: the process model context, the team context, the project context, and the organization context.

The process model context is essentially identified with the concept of roles. Dewayne pointed out that while in reality people talk about what they do, how they do it, the tools they use, and the people they do it with, in modeling we talk about roles, not people. This turns out to be a good abstraction, but it ignores everything that actually goes on related to people. In particular, the roles abstraction glosses over the fact that people do many things at the same time, people change what they are doing, people cooperate and interfere with each other, and people are a scarce and expensive resource.

Dewayne Perry continued by giving his perspective on from where he thought the concept of roles derived. In a craft society, roles embody process. Y being an X meant that

- Y was initiated into the mystical arts of Xing via an apprenticeship,
- Y understood the materials used by an X, and
- Y knew all the processes practiced by an X.

In an Engineering Society, processes are explicitly defined. The notion of “role” is then either an abstraction for a person who does a related set of activities or is a defined set of skills. Dewayne argued [for the sake of generating discussion] that “Y acts in the role of an X” is really just turgid prose for “Y does X”.

Watts Humphrey made the point that assigned roles are usually interpreted as a constraining view on responsibilities. The alternative is an expanding view where we talk about goal-directed models rather than role-directed models.

Mark Dowson disagreed with Dewayne Perry’s view of role in the process model. Mark prefers to interpret roles as “types” that help you understand responsibilities and relationships, but does not necessarily constrain you to those. For example, someone must “occupy the role of receptionist in this hotel”, and know that there is such a role is useful information. Dewayne countered by saying that we want to bind people to activities, not roles.

Bob Balzer complained that Dewayne had presented a mixture of several things, including (to echo Mark’s point) the notions of instance (role occupant) and type (role). Further, nothing about roles conflict with people activities. So, there are deficiencies in some notions of roles, rather than deficiencies in roles themselves. Carolyn Seaman felt that the problem with the concept of role is that it is not powerful enough to
model people in the process. We can model complex relationships among tasks, but we cannot express relationships between people that affect how people relate. These are really organizational issues. Lolo Penedo agreed, but emphasized that it is necessary to separate the binding of roles to people and the binding of roles within environments.

Alfonso Fuggetta felt that we need to focus on the real issue, which is that if we want to reason, then we need to abstract. This leads to the question of what are the appropriate definition mechanisms for roles [types]. Alfonso gave an example from a CSCW system: People behave according to roles, such as speakers and moderators, but people can have multiple roles, since moderators are also speakers. So there should be a mechanism for defining roles, for associating roles with people, and for describing relationships among roles. Alfonso pointed out that Dewanye’s slides imply a static mechanism. Is this good? Alfonso’s main point was that we need to start from something concrete, such as example scenarios, suggest mechanisms for those scenarios, and then analyze whether the mechanisms are good or bad. Carlo Ghezzi agreed with Alfonso, stressing that roles give us a way to structure our understanding. For example, we can compare the notions of role and type which have obvious similarities. Carlo sees the need for a role hierarchy similar in concept to a type hierarchy. But how does a particular person change their role? This seems different from the traditional association of instance and type. In general, the notion of role seems more dynamic than the notion of type, but this does not mean that the notion of role is useless.

Dennis Heimbigner felt that the discussion is too abstract and so we should look at existing process enactment systems, where role is used concretely as a grouping mechanism and to control access rights. This hard notion of role leads to either reduced dynamicity or to roles that grow bigger and bigger to accommodate more activities, thus become meaningless. The needs of roles should be broken down into the basic factors of what they are used for. Dennis made the assertion that all existing process systems have gone too far in their use of role. Roles are a broader concept than a grouping activity, according to Stefan Wolf. Rather they are a filtering mechanism that helps us to concentrate on necessary information. John Diamant felt that roles not only have the problem of granting access rights that are too narrow, but they also provide access rights that are too broad. You may want to grant access rights to a particular person in a role that is appropriate for that particular activity, not for some other activity performable by the role (and by some other person filling that role). Dennis brought up another example, which is the concept of “space” used in Simon Kaplan’s system. This concept has the same feeling of constraining behavior that will lead to trouble.

Watts Humphrey wanted to know what our goals are for role modeling. If they are to help us to define increasingly complex process models, that is one thing. On the other hand, if our concern is to describe how people are to use the process models, then we need to recognize that roles have the problem of constrained behavior.

Starting from the premise that models are used to predict behavior, Larry Votta asserted that roles as models of people’s behavior would be difficult to use in predicting how two people might actually interact. Bob Balzer countered that this problem, in general, is found in any sort of abstraction. The real problem is not particular to roles, but we have not created mechanisms that allow people to operate in an “open” way. How do we give people flexibility at the same time as giving them guidance? But we are not accustomed, according to Larry, to dealing with the degree of variability exhibited by people. Bob felt that this is because we use the narrow programming language concept of binding in the context of roles. The trap that we fall into is that we try to explain all phenomena we see by using the closest computer science concept that we can find. Related to this, Carlo Ghezzi pointed out the misconception that binding is necessarily static.

Taking a rather different view, Issy Ben-Shaul made the point that roles can help tools to
bind/find people. For example, we may need to
dynamically find the right person to fill the right
role. Dewayne Perry argued that we really have
two kinds of processing agents, but we don’t talk
about the “roles of tools”, so why should we talk
about the “roles of people”? We should therefore
view people in terms of the activities in which they
are engaged. But Alex Wolf asserted that we do in
fact talk about the roles of tools, in the
sense that we have a well-developed concept of
“interface” to computational entities. Roles are
perhaps our attempt at defining a notion of in-
terface for people. Now, there is more variability
in this kind of computational entity than we are
used to, but this is why the notion of role is per-
haps more complicated and why it is not yet as
well defined. Carlo Ghezzi argued that we need
to talk about roles exactly because, compared to
tools, people are more dynamic, unpredictable,
and have a much larger state space of possible
behaviors.

Nazim Madhavji advocates the view described
in Dennis Heimbigner’s position statement that
we need to break down the notion of role into its
constituent to better understand what operations
we want to associate with those constituents. On
the other hand, you cannot formalize human be-

havior and so we must make our process systems
compatible with human behavior.

Volker Gruhn felt that we had reached consen-
sus on the utility of roles, so that we should move
onto discussing people in the context of organiza-
tional structures.

Dewayne Perry refocused the discussion by
claiming that organizations are the structure
within which projects, teams, and people execute
processes. The organization determines the cul-
ture in which processes are executed—by select-
ing the people, the reward system, and the un-
derlying technology. The organization also often
determines the process boundaries, which leads
to a question of process componentry, process in-
terfaces, and indeed process architecture. The
organizational structure defines the lines of com-
munication within the organization. Finally, the
organizational structure results in a slow evolu-
tion of process. Dewayne asserted that perhaps
we should have a process-driven organizational
structure rather than an organization-driven pro-
cess structure. Along those lines, it is interesting
to notice that there are two major organiza-
tional structures, functional and task. Func-
tional organizations arise in response to rapid
technology changes. In the absence of such rapid
changes, task organizations arise. An example
of a task organization is the use of empowered,
inter-disciplinary teams consisting of people with
different skills and responsibilities. Such teams
minimize handoffs, enable faster and more effec-
tive decisions, and enable independence and con-
currency.

Carolyn Seaman questioned whether organiza-
tions really do change slowly. The problem is
that organizations are changing without any con-
sideration of process. Is this good or bad? Sup-
porting software development is not the only con-
sideration. Organizations are, for example, of-

ten designed by available resources. Consistency
is more important than whether the organiza-
tion is process-driven according to Kathleen Cul-
ver Lozo. So, the question of whether the process
drives the organization or the organization drives
the process is not as important as whether the
two are consistent/symbiotic.

Alfonso Fuggetta complained of frustration
that we, as software process experts, are not or-
ganizational experts and so cannot provide useful
insights into this question. Alfonso proposed a
concrete question based on his experience in us-
ing the CMM to assess a software organization.
He found that CMM does not address organiza-
tional issues, such as the effects of changing from
a functional structure to a task structure. We
need to find technical issues that we can address.
(Watts Humphrey pointed out that CMM people
did not have the expertise to address organiza-
tional issues.) Bob Balzer warned that software
process questions are already very difficult and
that we should be careful about attempting to
bring in organizational issues, which are them-
selves very difficult. John Diamant believes that
our contribution can be to provide an understand-
ing of the impact of organizations on process so that we can set up the organization consistent with the process. Organizations do not view processes as ends, but as means to an end, according to Manny Lehman. So, organization controls the process, but because of inertia, the reality is that process controls organization. On the other hand, Carolyn Seaman pointed out that organizational theorists are not interested in software process, so we need to address the questions. Larry Votta disagreed and asked whether software organizations are really different from other organizations. In fact, organizational theorists are potential customers for our process abstraction facilities.

Patrick Young wondered how one represents organizational structures. Carolyn Seaman advocated the use of graphs, with links as team structures. This is so far not very satisfactory and the view is rather static. Larry Votta referred to a study he conducted with Dewayne Perry, where they found that managers think of organization, process, and technology as independently optimizable entities. Carolyn pointed out that team structures are often formed to address communication problems.

The session concluded with Dewayne Perry wondering whether the communication and collaboration mechanisms for process in the small are appropriate for process in the large. Bob Balzer likened the question to the problem of interlevel mapping in any attempt at abstraction. Dewayne expressed the fact that his concern is really the integration of multiple processes. Patrick Young believes that a difference lies in whether an organization is large or small. Large organizations require more formal communication paths. Alex Wolf pointed out that large organizations do not necessarily execute complex processes. There is an issue here of how to measure the complexity of a process. Kathleen Culver Lozo observed that there is a size effect when trying to map processes designed for small processes onto large organizations.