A Conceptual Framework for Workforce Management: Impacts from Service Science and S-D Logic

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Abstract. Over the past four decades the service sector shaped advanced forms of interaction between human and technology actors with a wide range of actor combinations like human-to-human, human-to-technology, or technology-to-technology. The understanding of workforce, on the other hand, has remained largely unchanged in recent decades. Workforce, workforce planning, workforce management, workforce diversity and so on, focus almost exclusively on the human actor. Therefore, the authors see the need for a new understanding of workforce and for the explanation of the mechanisms and interdependencies of workforce management. Based on the theoretical concepts of Service Science and S-D Logic as well as the approaches of meso- and micro-foundation the context of workforce and workforce management is studied and a conceptual framework for workforce management and a new definition of workforce is derived.

Keywords: Workforce · Workforce management · Conceptual framework of workforce · Workforce design

1 Introduction

Work and its characteristics are highly dependent on social and technological developments. Historically workforce and workforce management has referred exclusively to human resources, which since industrialization has been changed with the machine as a kind of contrast. Over the past four decades the service sector shaped advanced forms of interaction between human and technology actors with a wide range of actor combinations like human-to-human, human-to-technology, or technology-to-technology [1–5].

These developments show that instead of the historical rather confrontational and replacing relationship between human and technology, now new forms of interactions and combinations of actor like people, technology and other resources arise and the relationship is getting more complementary, supportive and co-creative.

New forms of actor interaction and value co-creation change activities, roles and processes and are a central part of organizational strategies, productivity and social

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transformation. For example, demonstrates the technology-supported workplace – a actor combination of human-software-hardware - how strongly these developments influence forms of interaction, forms of work, work and social transformation.

The understanding of workforce, on the other hand, has remained largely unchanged in recent decades. Workforce, workforce planning, workforce management, workforce diversity and so on, focus almost exclusively on the human workforce [6, 7].

Therefore, the authors see the need for a new understanding of workforce and for the explanation of the mechanisms and interdependencies of workforce management.

2 Research Methodology

This research applies the Design Science Research Methodology (DSRM). Following [8] the research intents to deduce a commonly accepted conceptual framework for workforce management as research design artefact [8–10].

Based on the theoretical concepts of Service Science and S-D logic [11–14] as well as the approaches of meso- [15] and microfoundation [16] the context of workforce and workforce management is studied and a conceptual framework - understood as a set of definitions and concepts used to describe the phenomena, formulate questions and make generalisations - designed [17].

Referring to DSRM [8] our overall research proceeding is divided into six activities (see Fig. 1) which are presented in the following briefly.

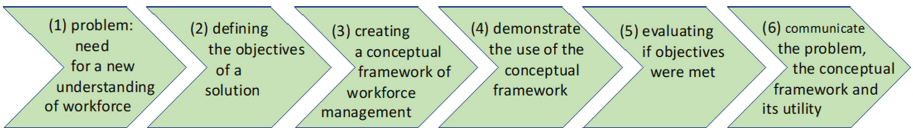

Fig. 1. Research process

In the (1) problem identification and motivation, we point out that the existing definitions and interpretations of workforce and its specifications refer only to humans and thus are not suited to correspond to the advanced and diverse interactions and combinations of humans and technology.

As we (2) define the objectives of the solution, we aim at

- explaining the wide range of actor combinations and the advanced forms of interactions
- outlining the process of value generation and the combination of actors
- approaching a new definition for workforce and a consistent concept for workforce management.

In activity (3) we create a conceptual framework of workforce management based on

- theoretical Foundations of Service Science and S-D Logic
- micro- and meso-foundation for value co-creation.

Activity (4) demonstrates and evaluates the conceptual framework of workforce management.

Activity (5) evaluates if the objectives were met.

Finally, we (6) communicate our findings, the role of the conceptual framework and derive a first suggestion for a new understanding and definition of workforce.

3 Creating a Conceptual Framework of Workforce Management

In order to model and represent the different actor combinations as well as the process of value co-creation on different effect levels, approaches and foundations of Service Sciences, S-D logic, Social Theory, meso- and microfoundation were used and combined to develop a conceptual framework for workforce management.

3.1 Theoretical Foundations of Service Science and S-D Logic

With reference to Penrose (Penrose 1959), the force for the organization does not come from the single form of the resource itself but from the services the resource render (p. 25, Penrose 1959). In this sense the term service will be used in line with Service Science and S-D Logic which uses the term service to reflect the process of doing something beneficial [11, 18]. Service is understood as the application of resources (human competencies, knowledge, skills, products, technical services, augmented capabilities through technology) for the benefit of another entity [5, 18, 19].

S-D Logic provides the foundation for a general theory of markets and marketing. Service is the fundamental unit of exchange. Value co-creation is the core of the narrative and process of S-D Logic. In this process service exchange happens through actors integrating resources enabled and constrained by institutional arrangements nested in service ecosystems [11, 20, 21].

Following the foundational concepts of Service Science [4, 22] it is obvious to address the actor combinations of workforce by using the abstraction service system or service system entity, "which is a configuration of people, technologies and other resources that interact with other service systems to create mutual value" [23]. As specified by Spohrer and Kwan (2009) service systems are dynamic value co-creation configurations and "all service system entities are resources, but not all resources are service system entities" [22]. In contrast to service systems the concepts of systems or organizing systems are more abstract arrangements of resources that interact and form a whole [1, 17] – but the character of value-proposition based interactions for mutual value generation is not mandatory.

Therefore the definition of actor combinations as workforce systems consciously distinguishes itself from the definition of service systems, because as recognizable in organizations the key condition for service systems to interact to co-create value is not always fulfilled [24]. Therefore, workforce systems can be basically divided into three categories: organizing systems as resources arranged to enable interaction [1]; systems

as arrangements of resources that interact [17]; and service systems as configurations of resources that interact in the sense of value co-creation with other service systems to create mutual value [22].

3.2 Coleman's Boat and the Microfoundation Movement

Coleman's boat or also called Coleman's diagram or in the German-speaking world it is also called Coleman's bathtub is one of the most famous visualizations in sociology [25]. The boat addresses the relation of large-scale things - the macro level - like organizational or social events to smaller-scale things - the micro level - like individual behaviour. By providing a systematic way to think about the macro-micro relations the central motivation of the microfoundation movement is to "unpack collective concepts to understand how individual-level factors impact organizations, how the interaction of individuals leads to emergent, collective, and organization-level outcomes and performance, and how relations between macro variables are mediated by micro actions and interactions" [26].

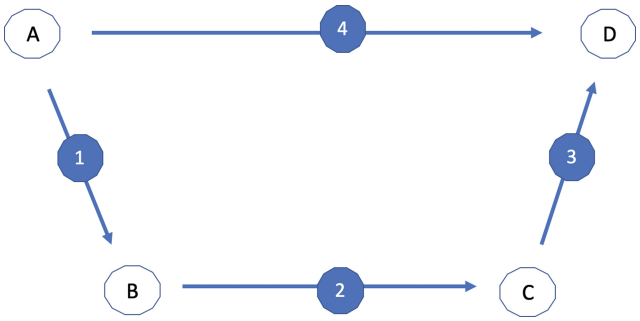

Fig. 2. Coleman's boat

The nodes (A) and (D) refer to the macro facts that might be cited as causes of social, economic or political phenomena. On the macro level (D)'s are the macro facts to be explained. It is relevant to note that (A) and (D) represent not the whole macro level but only a part of it. Coleman's scale of macro is flexible and can scale from two persons to organizations and nations [16, 25].

Arrow 1 between (A) and (B) reflects the observance that the state of (B) at micro level changes when the state of phenomenon (A) at macro level changes. Arrow 1 shows that the phenomenon (A) is a boundary condition according to which the actor aligns his actions. (A) may be the cause or only one reason for the change in the state of actor (B).

Arrow 2 shows how the de facto actions of the actors bridge between changes in states of (B) and outcomes of (C).

Arrow 3 then shows how a new macro phenomenon is aggregated out of the sum of the actions and that the relation of (C) and (D) is one of logical implication [25].

As pointed out in Fig. 1 the boat is the visualized result of macro-micro explanations where changes in macro level initiate observable actions on micro level (arrow 1, macro-micro mechanisms); individual actors adapt the new context with action (arrow 2, micro-micro level) and the transformation and aggregation of these outcomes describes how macro level changes (arrow 3, micro-macro level) arise.

3.3 Mesofoundation by the Extension of Colemans Boat by Storbacka et al.

Storbacka et al. [2] explain S-D Logic concepts with Coleman's boat. Arrow 1 in Fig. 3 shows the macro-macro explanation of S-D Logic "which implies an outcome of value co-creation based on service exchange within the context provided by the institutional logic of a service ecosystem" [2].

'Referring to Coleman's boat and by incorporating the insights of the microfoundation movement [26, 27] Storbacka et al. underline that macro-macro level explanations can be lacking in explanatory power. Therefore, Storbacka et al. anchor and reveal the causes of the more abstract macro concept of value co-creation with micro (actor engagement) and meso (sets of actors and their resources) level mechanisms.

Institutional logic on macro level forms the meso level conditions and context for actors to engage with their resources on engagement platforms (arrow 2) and influence by this the disposition of the actor (arrow 3). This leads to a change in actors' disposition and to engagement activities that can be characterized by observable engagement outcomes (arrow 4).

The engagement of many actors leads to the emergence of various resource integration patterns (arrow 5); on the meso level the extant resource configurations of the actor are transformed which leads to value co-creation (arrow 6) [2].

By exploring the relevance of individual actor engagement on micro level in service for service exchange and resource integration Storbacka et al. show actor engagement as a microfoundation for value co-creation. It is shown "how the interaction of individuals leads to emergent, collective and organization-level outcomes and performance and how relations between macro variables are mediated by micro actions and interactions" [26].

As emphasized by Ng [15] or Dopfer et al. [28] "The domain of change in an evolutionary process is neither micro nor macro but meso", the transformation mechanism, i.e. the transfer of a multitude of actions from different actors, can best be explained by the meso level.

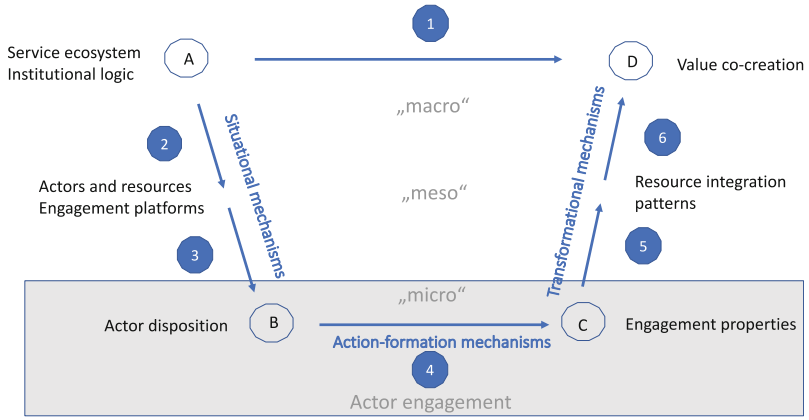

Fig. 3. Storbacka et al. (2016). The Coleman bathtub: Actor engagement explains value co-creation.

3.4 A Conceptual Framework of Workforce Management

Building upon the microfoundation movement in strategic management and the SDL based conceptualization of actor engagement as a micro foundation for value co-creation by Storbacka et al. the authors use the approaches to derive a foundation for the concept of workforce.

Applying the transdisciplinary perspective, "actors are viewed not only as humans but also as machines and various combinations of humans and machines." [2]; the approach of actor engagement can also be applied to workforce engagement.

Starting on the macro-macro level, arrow 1 (Fig. 3) explains the macro-macro relation which implies an outcome of value co-creation and organizational development. According to Service Sciences and Service-Dominant Logic the outcome is based on service exchange within the context of a service ecosystem and its institutional logic.

The service ecosystem is defined as "relatively self-contained, self-adjusting systems of resource integrating actors that are connected by shared institutional logics and mutual value creation through service exchange" [20, 29, 30]. The service ecosystem of an organization depends from its positioning, that is its business model, customers, partners, employees and other stakeholders.

The organization, its strategy, its service ecosystem and the shared institutional logic forms the context for actors to engage with their resources. As shown by Storbacka et al. [2] these situational mechanisms form the meso level conditions for influencing actor or workforce engagement at the micro level (arrows 2 + 3).

The situational mechanisms lead to actor's disposition to engage and to outcomes (arrow 4) like engagement properties which can be observed. Therefore, a change on macro level e.g. in organizational strategy and an associated development program of talents, skills and competences influences the situational mechanisms of actors and

resources and triggers workforce engagement. By this engagement activities of workforce resources like people, technologies or their combinations, start (arrow 4). The observable outcome of workforce engagement are engagement properties for instance workforce systems like skill database, talent management system or eRecruiting system.

At the meso level, transformation mechanisms and integration patterns lead to the result that the workforce systems (engagement properties) being transferred into value co-creation.

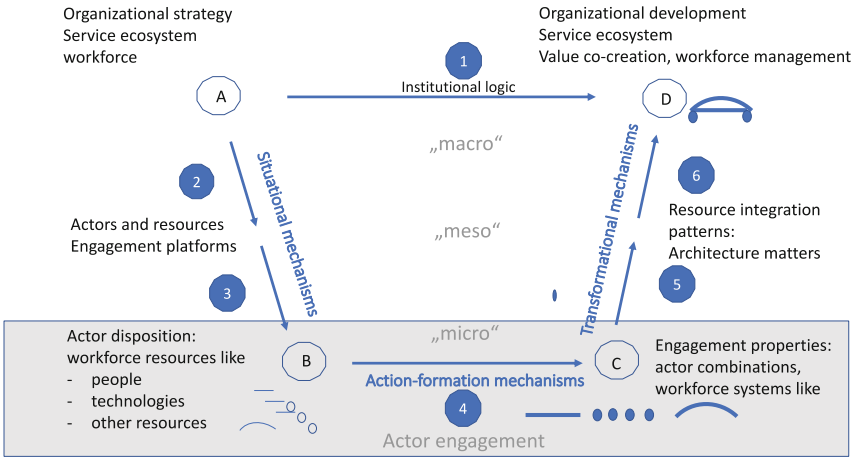

Fig. 4. The Coleman boat: Architecture matters as transformation mechanism

4 Demonstration and Evaluation of the Conceptual Framework

We examine the conceptual framework from Fig. 4 using a practical example from the workplace productivity tool sharepoint (office 365, Microsoft). Sharepoint is a new, modern platform which enables shared access to information like presentations, interaction, and collaboration by desktop sharing. Teamwork can occur anywhere and anytime quickly, reliably, and securely. Shrinking search and travel times and faster coordination cycles are the result.

Macro level: The organization decides to make greater use of the technical possibilities to increase cooperation and productivity by introducing new workplace technology (A). On the macro level institutions like company affiliation, personnel number or authorisation system are necessary to create conditions for workplace-related value co-creation (arrow 1).

Meso level: At the meso level, situational mechanisms such as engagement platforms are necessary both as a concept that presents the new possibilities of workplace technologies and their possibilities for the company and the individual employee (arrow 2) and as a facilitator for the actors' engagement (arrow 3).

Micro level: (B) as a result of meso level changes actor dispositions at micro level change. Actors like human (employees), technology (software like office 365/sharepoint) or other resources like hardware (server) engage in action-formation mechanisms. Workforce systems as actor and resource combinations like human-to-human; human-to-technology (e.g. employee training on office 365/sharepoint), or technology-to-technology (server and application) arise. This is how engagement properties emerge (C, arrow 4).

Meso level: The transformation mechanisms on the level of engagement platforms now decide whether there is a process of mutual value creation between the engagement properties (workforce systems) and the organization. Here the resource integration pattern is of great importance to enable interaction and service exchange. If this process of mutual value creation between the configurations of resources (organization) and the engagement properties succeeds, then workforce systems of the category service systems will be created: office 365/sharepoint will be used to improve team collaboration and enhance productivity (arrow 5).

Macro level: (D) coming back to the macro level organizational development is enhanced, understood "as improving the ability to adjust, integrate and apply the organization's resources" (arrow 6) [31].

5 Approaches for a New Understanding of Workforce and Workforce Management

On the basis of the conceptual framework derived from Service Science, S-D Logic, Social Theory, meso- and microfoundation, a new understanding of workforce and workforce management can be established.

The new understanding of workforce does not limit workforce to the human being but stands for all actor combinations that contribute to an organization [32].

How deduced in the conceptual framework (Fig. 2) the actor combinations and workforce systems as engagement properties do not have in every constellation a value for the organization. The value for the organization is only created with implementation of the process of interaction between the workforce system and the organizational service systems characterized by resource integration and mutual value generation.

The significance of workforce management is to create the conditions for this and to ensure the process of value creation cooperation and mutual value creation. Workforce management therefore can be understood as the set of activities and efforts facilitating the process of interaction and resource integration between workforce systems and organizational service systems for mutual value creation.

As a result, workforce management makes the difference whether a workforce system becomes a service system that creates mutual value with other service systems of the organization or not. If this process cannot be initiated, then workforce systems will remain organizing systems or systems as arrangements of resources, but they will not become service systems [1, 17, 19].

If the workforce management succeeds in enabling this process, the organization improves its ability to use the available resources and organizational development - understood "as improving the ability to adjust, integrate and apply the organization's resources" (arrow 6) [31] – takes place.

6 Findings, Conclusion and Outlook

The theoretical concepts of Service Science, S-D logic, Social Theory, meso- and microfoundation are suitable for describing the mechanisms of the wide range of actor combinations and the process of value co-creation.

In conjunction with the micro- and mesofoundation it is facilitated to point out, model and describe the workforce mechanisms not only in the actor-to-actor context but also to consider, model and describe the workforce mechanisms between macro-, meso- and micro-level.

With the help of the derived conceptional framework for workforce management, it is thus possible to explain the manifold actor combinations and initiate a new understanding of workforce taken as all actor combinations that contribute to an organization and workforce management as the set of activities and efforts facilitating the process of interaction and resource integration between workforce systems and organizational service systems for mutual value creation.

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