A Knowledge Worker Desktop Model (KWDM) Applied to Decision Support System

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INTRODUCTION

The concept of information system covers two notions: on the one hand, the reality of the evolving organization that collects, communicates, and records information; and, on the over hand, the digital information system, artificial object conceived by humans to acquire, process, store, transmit, and restore the information allowing them to carry out their activities within the context of the organization (Reix, 1995). We shall refer hereinafter to the digital information system.

In the first part of this article, we present the knowledge worker desktop's model (KWDM). This model highlights three types of data: "main-stream" data, shared-data, and source-of- knowledge-data.

In the second part, we describe a group decision and negotiation system (GDNS) for operational performance management (OPM) implemented in an entertainment company based in France. This GDNS addresses a zero latency organization problem that is to provide decision makers, both strategic and operational, with the insight they need to interpret multiple and complex operational data, and take immediate decision close to the action.

In the third part, in order to validate the KWDM model, we present the methodology that consists to match each system's component with each model's element, and the study's outcomes. This analysis leads to highlight the formalization of the different data flows, the impact of the system on the organization, and to confirm the importance of human factor in the group decision and negotiation process. Furthermore, it opens new, perspectives particularly the influence of the intention, the importance of shared-data system and the role of the system in the organizational learning process to insure the business continuity plan.

THE KNOWLEDGE WORKER AT HIS COMPUTERIZED DESKTOP

The Evolution of the Employees Role within the Company

What makes knowledge valuable to organizations is ultimately to make better the decisions and actions taken on the basis of knowledge (Davenport & Prusak, 1998). Nowadays, information and communication technologies (ICT) modify radically our relationship to space and time. In this context, initiatives and responsibilities are increasing. Employees are placed in situations in which they need to take decisions. They are becoming decision-makers, whatever their roles and their hierarchical positions. For their missions, through their computerized workstation, they must have access to information and knowledge widely distributed in their organization. Furthermore, to make decision and act they activate their cognitive processes and produce new knowledge. According to the term coined by Peter Drucker around 1960 (Drucker, 1993) "they become 'knowledge workers,' who are knowledge executives who know how to allocate knowledge to productive use—just as the capitalists knew how to allocate capital to productive use; knowledge professionals; knowledge employees." In short, a 'knowledge worker' is a worker who develops and uses knowledge. This definition is extended by Porter, Bennet, Turner, and Wennergren (2002) as "worker whose job depends on the processing and use of information in a continuously changing work environment." Afterwards, we define a knowledge worker as follows: "A knowledge worker is a worker whose job depends on the processing and use of knowledge and information in work situations

that require decision making, and demand his initiative and responsibilities." This definition points out the increasing autonomy of people due to information and communication technologies.

Beyond the technical infrastructures, the digital information system has to bring, to each individual, useful information. Moreover, the digital information system has to supply means to share the knowledge with distant colleagues, and to enable access to essential knowledge in order to solve problems out of routine.

THE THREE GENERAL CATEGORIES OF DATA

Our researches, focused on knowledge management and the knowledge worker at his computerized desktop, led us to distinguish three general categories of data to be processed by the digital information system: the "main-stream" data, the "source-of-knowledge" data and the "shared" data (Grundstein & Rosenthal-Sabroux, 2001).

The "Main-Stream" Data

The "main-stream" data make up the flow of information that informs us on the state of a company's business process or working information needed by each individual to act. For example, in a bank, the digital information system is a company's production system. In this case, the "main-stream" data inform on the state of the information related material to be transformed, and on the state of the digital information system which carries out this transformation. On the contrary, in the industry, the company's production system involves physical materials. In this case, the "*main-stream" data* provide information on the state of that material before and after the transformation, and give information on the whole environment that makes this transformation possible.

The "Source-of-Knowledge" Data

The *"source-of-knowledge" data* are the result of a knowledge engineering approach that offers techniques and tools for identifying, acquiring, and representing knowledge. This knowledge, encapsulated in computer programs capable of reconstructing it as information immediately understandable to human beings, thus becomes accessible and can be handled. This leads us to integrate into the digital information system specific modules called *"source-of-knowledge" data* systems, which both in their conception and in the techniques used to implement them influence the results produced through new orientations in knowledge engineering research (Charlet, Kassel, Bourigault, & Zacklad, 2000).

The "Shared" Data

Moreover, the information and communication technologies have caused a rupture with older technologies, a rupture linked to the relationship of human beings to space, time, and capacity to be ubiquitous, which take us from the real world to a virtual one, from the manipulation of concrete objects to abstract ones. The instantaneous transfer of digitalized multimedia documents which include texts, images, and sounds, the possibility of asynchrony of information exchanges which transforms our relationship with time and space, electronic conferences which allow us to be in different places at the same time, engender a transformation in our behavior at work. They accelerate the publication and dissemination of documents, they facilitate working in groups, they modify our means of communication and, above all, they speed up the transmission and sharing of tacit knowledge which, up to now, operated from person to person on a master apprentice basis. In short, they generate processes of information exchange that were unbelievable with previous technologies. Information processed by these technologies is called "*shared-data*."

The Knowledge Worker Desktop's Model (KWDM)

Within the company, knowledge workers find themselves confronted with situations that go beyond daily routine, situations in which they must evaluate all possible choices in terms of criteria relevant to a given set of goals. Taking into consideration all available information ("*main-stream" data*, "s*hared" data*, *"source-of-knowledge" data*), their own intentions, any restrictions which influence their decisions and their knowledge and know-how, they must analyze and process information in order to make these choices. We have materialized this vision under an empirical model form so called KWDM described (see Figure 1).