

Robotkirurgisk Tjänsteproduktion – Distanserad närhet

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Robot surgery

- Remote closeness providing a new method of human-robot interaction within top-level service production

Abstract

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The late 20th and early 21st centuries have seen a rapid increase of powerful robotic systems in healthcare operations. The overall purpose and motivation of this research has been to go beyond previous investigations on robotic applications that have been restricted to technical issues or medical parameters. While technological and medical aspects of emerging robotic applications are important to acknowledge, we still lack an understanding of how surgical robots are affecting teamwork and organization in healthcare operations. The aim of this study is to explore how robot technology is used at the micro-level organization in surgery.

The case studies are comprised of eighteen observations of surgical operations at five medical departments, one in the United States and four in Scandinavia. In addition to direct observations of surgical operations, fifty-one surgical team members were interviewed at these sites.

Work processes performed by robot surgical teams are best characterized as advanced forms of knowledge-intensive service production that currently involves less human-to-human interactions and increasingly more human-to-robot interactions in the operating room (OR). What I choose to call *anticipated organization* (AO) best describes how teamwork is organized in the OR. AO is a fundamental precondition for interactive flow, which according to participants' descriptions creates efficient organization during surgery. The impact of AO is even more important when team members interact with each other at a physical distance, which is the outstanding characteristic of robot surgical teamwork activities.

Furthermore, the predominant characteristic of work activities and interaction patterns in robot surgical teams has been described as *remote closeness*. On the one hand, the head surgeon interacts with the patient and other team members remotely at a physical distance. On the other hand, by means of the robot's four arms and technological mediation, the head surgeon is still interacting in close proximity *through* the technological interface, *on* the patient, and *with* the surgical team. The *remote closeness* creates disintegration within the previous physically integrated surgical team in traditional open surgery, splitting it up into two teams: a primary and a secondary team. The primary team consists of the head surgeon and the robot interface which connects to the patient. The other medical staff members form the secondary team.

This study contributes to the prior knowledge base in management research by improving our understanding of the new forms of work interactions between humans and service robots. This includes rich qualitative descriptions of how robot technology is socially constructed by practitioners and the thesis presents a new taxonomy of robot technology's characteristics. Another contribution of this empirically-grounded study has been to introduce a practitioner-oriented dimension into existing Human-Robot Interaction (HRI) research.

Key words: robot surgery, teamwork, organization studies, business administration, ethnography, health care, anticipation, human-computer interaction, human-robot interaction, robotics