Pathology (April 2014) **46(3)**, pp. 165–168

OPEN

EDITORIAL

Factors affecting the implementation and use of electronic templates for histopathology cancer reporting

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Key words: Checklist, electronic health records, information systems, organisational change, professional practice, quality improvement, synoptic reporting.

INTRODUCTION

The surgical pathology report on cancer resection specimens is fundamental to providing clinicians with the information needed for adequate patient oncology treatment. Since the multi-institutional quality study on pathology reporting of colorectal cancer published by Zarbo in 1992,[1] many other studies have shown that the use of checklists or synoptic reporting is superior to traditional narrative (free text) reporting.[2–4] Using electronic health records, synoptic histopathology reporting tools can be designed to be very sophisticated with discrete data fields, drop down menus, and automated SNOMED encoding.[5] The use of discrete data fields ('atomic data') means that it is possible to automatically search, extract, and transmit data electronically.[4] Despite the apparent benefits of electronic synoptic histopathology reporting, and the successful regional implementation of such a reporting system in Ontario, Canada,[5] others have reported that the implementation and use of electronic histopathology reporting is no easy organisational task.[6,7] Similar challenges have also been reported regarding the implementation and use of a web-based synoptic reporting tool for cancer surgery.[8,9] From a management and organisational perspective, the list of possible causes for project failure with respect to information technology development, implementation and use is long.[10] In our opinion, a pro-active understanding and management of key organisational issues is a requirement for successful long-term synoptic histopathology cancer reporting.

INFORMATION SYSTEM CHANGE

Organisational issues

An organisation's information system can be viewed as an interaction between actors, tasks, organisational structure, and technology (Fig. 1). Information system change is the deliberate change to an organisation's technical and organisational subsystems that deal with information.[11] The introduction of synoptic reporting within a pathology department can be viewed as such a change. The change process covers initiation, development, implementation, and operation/maintenance of the new elements introduced.[11,12] Changes within a department's information technology systems (IT systems) and working routines may be considered a task to be decided by the department itself. However, independent of the formal decision procedure, a number of other organisational units and individuals will be affected by or can influence such a change. The complex relationship between stakeholders potentially affecting, or being affected by changes within a single department is illustrated in Fig. 2. Clinicians will clearly be affected by a move from narrative to synoptic histopathology reporting. The hospital harbouring the pathology department may have a general policy on IT development, and there may even be regional and/or national policies on IT systems that one must adhere to. Similarly, external organisations such as regional or national cancer registries will be affected by, and can affect, a transition from narrative to electronic synoptic reporting. Vendors are also required to develop the IT tools needed. Understanding and managing the needs and interests of all such stakeholders is essential for achieving the organisational changes intended.[13] In their study on the implementation and use of a web-based synoptic reporting tool for cancer surgery at two hospitals in Nova Scotia, Canada, Urquhart and co-workers found that implementation and early use of the synoptic tool was affected by many factors external to the individual user. A good understanding of the multilevel organisational environment in both the planning and implementation process was deemed important for project success.[8] In a similar study on the implementation of synoptic pathology reporting in four pathology departments in three states in the USA, Hassell and co-workers found that adaption depended both on individual user factors and organisational issues. With respect to the latter, an asymmetric organisational balance between benefits and costs was considered a possible hindrance for implementation. If the pathology laboratories were to carry the financial burden for implementing electronic synoptic reporting but considered the cancer registries the beneficiaries of the new reporting tool, why should the laboratories change their information systems?[6] However, even in an environment where the development of an electronic synoptic pathology tool was free of costs for pathology laboratories, local adaption varied greatly. Some laboratories had a user rate above 90%, while other laboratories had not implemented the synoptic tool at all.[7]

Issues related to individual behaviour

Even after the successful development and implementation of a new IT tool, successful long-term usage is not guaranteed. Health care professionals may not adhere to new guidelines and practices,[14] and each individual's adoption and use of new IT solutions is affected by a number of interacting factors (Fig. 3).[15] In 1975 Fishbein and Ajzen proposed a model for trying to explain individual behaviour in specific contexts.

Print ISSN 0031-3025/Online ISSN 1465-3931
DOI: 10.1097/PAT.0000000000000065

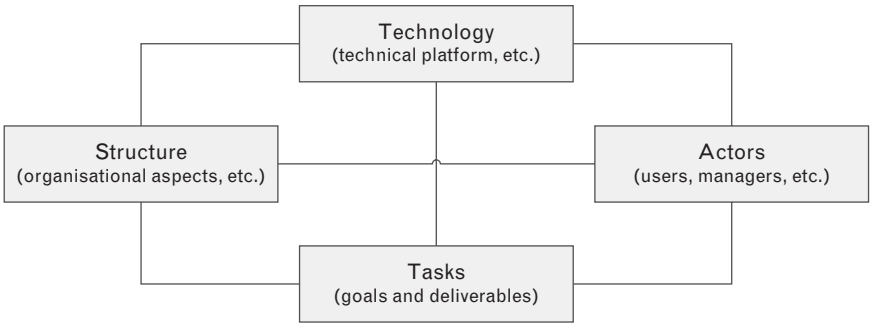

Fig. 1 Socio-technical model of an organisation's information system(s) (modified from Lyytinen and Newman[11]).

A central factor in the theory is the individual's *intention* to perform a given task.[16] The original model was later modified to a 'Technology Acceptance Model' to try to explain user acceptance (or rejection) of technology.[17] This model has again been further developed to try to explain individual behaviour related to adaption and use of information technologies in the workplace.[15] Although the model has its limitations and weaknesses,[17,18] we find it useful when trying to untangle some of the factors affecting individual behaviour with respect to IT systems and electronic synoptic reporting in a pathology department.

In settings with individual voluntary use of synoptic reporting, engagement with pathologists is of course essential in all stages of the development and implementation phases of the synoptic tools to be used. However, even in cases where this has been ensured, individual behaviour is difficult to predict. In our experience, perceived (and experienced) output quality and ease of use in combination with a positive subjective norm (as expressed by colleagues in the department) are important factors for a stable, high long-term use of synoptic reporting.[2]

In settings with compulsory use, the subjective norm will of course favour synoptic use, particularly if combined with a monitoring system. However, evidence from other settings of medical care indicates that such individual performance feedback alone is not sufficient to attain high adherence to a new procedure. Multifaceted strategies for interventions at different levels (individual health care

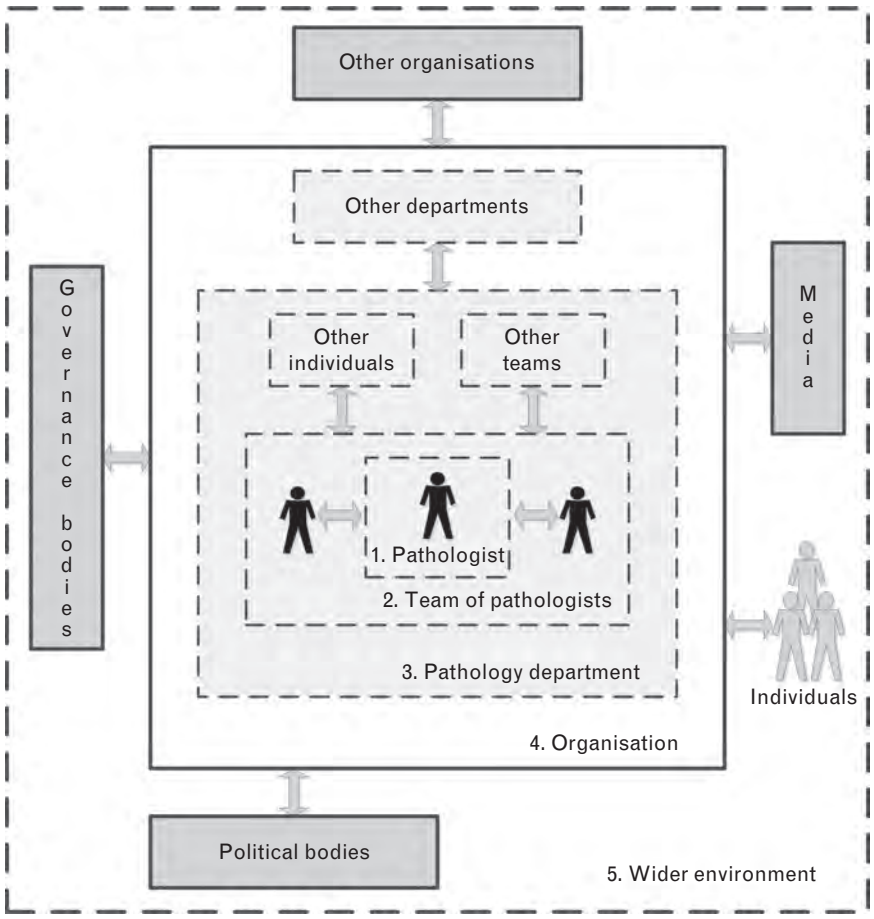

Fig. 2 Illustration of the complex relationship between the individual health care worker, health care team, department, organisation, and other stakeholders potentially being influenced by or influencing upon an intended change (modified from Grol and Grimshaw[14]).