

Workflow Process Support for the Clinical Routine – A Comparative Assessment of Hospital Information Systems (HIS)

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Introduction

Growing medical possibilities and administrative requirements have increased the information and documentation work load within the hospital dramatically. The improvement potential by the implementation of an appropriate hospital information system (HIS) is obvious. But when it comes to the selection of an adequate software solution, not only the direct costs for purchasing, customizing and implementing such a system, but also its potential for improving clinical workflows and meeting user expectations have to be considered [1, 2]. In this context a systematic user assessment was used together with the German Heart Institute Berlin for getting a comparative overview about the functionality and general impression of different HIS alternatives.

Methods

Based on a typical patient career for the German Heart Institute Berlin altogether 18 process tasks were predefined, that should be supported by the implementation of a HIS: 1 patient admission/admission planning; 2 outpatient admission; 3 diagnostics (lab/X-ray); 4 result & billing documentation; 5 inpatient admission; 6 cardiac catheter & OR planning; 7 resources planning (OR theatre/staff/CT); 8 cardiac catheter documentation; 9 OR documentation; 10 nursing documentation; 11 medical documentation; 12 medication; 13 quality assurance; 14 coding; 15 patient discharge; 16 medical discharge summary; 17 medical controlling (DRG grouping); 18 billing. Based on this process flow different producers of HIS solutions were invited to present their product alternatives within 180 minutes to an interdisciplinary expert team from the German Heart Institute Berlin (3 physicians, 3 nurses, 3 IT specialists and 2 administrators). Then the functionality of the software alternatives was assessed for each of the 18 predefined work tasks individually by each team member between “very good” (1 pt), “good” (2 pts), “satisfactory” (3 pts), “fair” (4 pts) and “poor” (5 pts) or “no statement possible”. In addition to that the general impression of each HIS was assessed using the same scale and 8 additional categories: 1 functionality; 2 adaptability; 3 organizational & process support; 4 routine support; 5 ergonomic design; 6 homogeneity; 7 safety for the future; 8 overall impression.

Results

Using this study design for 7 different software solutions (Orbis from GWI, ISHmed from TSI, Soarian from Siemens, iMedOne from ITB, Phoenix from Parametrix, Lorenzo from Isoft and MedFolio from Nexus) significant differences within the average assessment of each systems’ functionality based on the 18 predefined process tasks were found. As an example the average functionality assessment of the process task “15 patient discharge” varied for the 7 tested systems between “very good – good” (1.5 pts) and “poor” (5 pts). Also within the assessment of the 8 additional categories concerning the general impression significant differences were characteristic for the 7 HIS solutions. Nevertheless no HIS solution showed to be dominant within all 18 work tasks and the 8 additional assessment categories. Instead the calculation of each system’s average functionality for the 18 work tasks and 8 additional categories showed that only two systems reached an overall result close to “good”, while four systems were assessed “good – satisfactory” and one system was assessed as “satisfactory – fair” with altogether 6 out of 18 process tasks being assessed as “poor” by all voting experts.

Conclusion - The used assessment of the different HIS solutions based on the 18 predefined process tasks proved to be a very helpful basis for the selection of 3 software alternatives worth further investigation. But the selection of those 3 HIS alternatives could not be based on the numerical assessment results only. Instead also additional background information (about interface possibilities to other software solutions, the producers' developing and service strategies etc.) and hospital specific requirements (e.g. software solutions used by cooperating healthcare institutions, the importance of different process tasks being support etc.) had to be considered as well.

References

[1] Marsolek, I; Backhaus, C & Friesdorf, W (2002): Clinical Data Management Systems – Defining the Process Flow Requirements. Journal of Clinical Monitoring and Computing 17 (7-8): pp 484

[2] Robertson, S & Robertson J (1999): Mastering the Requirements Process. London: ACM Press