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Implementation of Specialized Software in Hospital Food Service Departments: A Multi-Case Study Approach

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General Background

- Increasing pressure for hospital foodservice departments to improve efficiency (Puckett, 2013)
- Focus on patient perception of all hospital inpatient services, including foodservices
- Introduction of an innovation brings uncertainty and challenges

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Statement of the Problem

- Capital funds in hospitals are limited
 - Direct patient care items often prioritized over support services (foodservice, housekeeping, transport services) needs (Puckett, 2013)
 - Modernization of hospital foodservices lag behind other areas of the hospital
- Lack of information regarding the impact and outcomes of specialized hospital foodservice software.

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Research Questions

1. What effect does the implementation of specialized food service software have on hospital food service departments' efficiency?
2. What were diet office employees' expectations and level of readiness for change as related to the implementation of automated diet office software?
3. What factors were identified by the food service staff and directors as barriers and/or facilitators regarding the implementation of specialized food service software?
4. How did employees of the department perceive the communication provided prior to and during software implementation?
5. What benefits and disadvantages related to the use of the specialized food service software did the department employees and department leadership perceives post-implementation?
6. What effect does the addition of specialized food service software have on patient satisfaction as measured through the Press-Ganey HCAHPS® survey?
7. What modifications to procedures did diet office personnel adopt post-implementation and why?
8. What is the attitude of hospital food service employees toward the perceived benefit and adoption of technology for personal and work use?

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Review of Literature

- Technology in Hospital Foodservice
 - Uses in Hospital Foodservice
 - Technology is becoming more common in hospital foodservice; however, there are some departments using manual systems (Puckett, 2013)
 - Examples of uses include: purchasing and inventory management, nutritional analysis, foodservice systems management, and communication (Hogge et al., 2006)

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Review of Literature

- Foodservice Patient Satisfaction
 - Not measured on the HCAHPS survey; often added by the hospital to the survey
 - Hospital foodservice quality includes: menu items, portion sizes, presentation, temperature, and interaction with staff (Kim et al., 2010)
 - High patient satisfaction with foodservices related to higher overall patient satisfaction (Woodside et al., 1989)

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Review of Literature

- Information Technology Adoption
 - Diffusion of Innovation (Rogers, 1995)
 - Four components: the innovation, communication channels, time, and social system
 - Willingness to adopt: the rate of adoption varies
 - Five adoption rate categories: innovators, early adopters, early majority, late majority, and laggards

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Methods

- Case Study Approach
 - A mandatory implementation of software into hospital food service.
 - 5 Hospital foodservice departments
 - A division of 17 hospitals
 - For-profit large corporation
 - Qualitative and quantitative methods
 - Data sources include: questionnaires, interviews, observations and secondary data

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Methods

Site Characteristics

Hospital Size*	Director's Credentials	Participants*	Menu Service Pre-Implementation	Diet Office Pre-Implementation Process
Site 1 Large	Registered Dietitian	1 FSD 1 RD 1 DO 2 DC	Room Service for one patient care area; traditional trayline for rest of the hospital.	Computerized diet office.
Site 2 Small	CDM	1 FSD 2 RD 1 DC	Provided menus for patients to order, but operated traditional trayline	Manual
Site 3 Medium	Executive Chef	1 FSD 2 RD 4 DC	Traditional trayline	Manual
Site 4 Medium	CDM; MBA	1 FSD 1 RD 1 DO 2 DC	Traditional trayline	Manual
Site 5 Large	CDM	1 FSD 2 RD 1 DO 2 DC	Room Service	Computerized diet office and call center

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Methods

- Questionnaire
 - Technology Readiness Index (TRI 2.0)
 - 10 question survey used with permission of Parasuraman & Colby (2015)
 - Sections two and three
 - 31 questions related to technology adoption, and adapted from Moore and Benbasat (1991), Davis (1989), and Boettger (2009)
 - Demographics
 - age, sex, education, average hours worked/week, job title

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Methods

- Interviews
 - In-depth responsive interviews
 - Main interview questions based on research questions
 - Follow-up questions used to explore answers and gain understanding (Rubin & Rubin, 2012)
 - Participants – a purposeful sample (Tracy, 2013)
 - Individuals invested in the implementation of the software
 - Food service directors
 - Diet office employees
 - Registered Dietitians
 - Diet office supervisors

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Methods

- Observations
 - Diet office and patient trayline functions
 - Provide context additional sources of evidence as recommended by Yin (2003)
- Secondary Data
 - Secondary data included financial and quality reports
 - Included data from six months pre-implementation through six months post-implementation

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Methods

- Pilot test – The questionnaire and interview guides were tested at a hospital within the studied division but was not designated as a case study site
- Interviews were transcribed, coded
 - Themes and trends were identified
 - Three individuals coded and analyzed the interviews
 - Triangulation of data
 - Multiple sources of data analyzed to draw conclusions

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Results and Discussion

- 27 individuals were interviewed
 - Five foodservice directors
 - Three diet office supervisors
 - Eight registered dietitians
 - Eleven diet clerks

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Results and Discussion

1. What effect does the implementation of specialized food service software have on hospital food service departments' efficiency?

- Staffing
 - Previously automated diet office sites added labor hours
 - Diet office procedures and diet clerk job duties in manual offices changed
- Financial
 - Site 1 experienced an increase in FC/PD and FC/ADP
 - Sites 2,3,4, & 5 experienced a decrease in FC/PD and FC/ADP

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Results and Discussion

1. What effect does the implementation of specialized food service software have on hospital food service departments' efficiency?

Chart 1: Average Food Cost/Adjusted Patient Day Pre and Post Implementation

	Site 1	Site 2	Site 3	Site 4	Site 5
Ave FC/ADP Pre	15.35	17.14	20.49	19.07	13.40
Ave FC/ADP Post	18.34	16.37	18.09	16.42	10.40

Chart 2: Average Food Cost/Patient Day Pre and Post Implementation

	Site 1	Site 2	Site 3	Site 4	Site 5
Ave FC/PD Pre	24.32	41.35	34.82	39.10	23.73
Ave FC/PD Post	29.10	40.68	32.30	32.40	18.14

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Results and Discussion

1. What effect does the implementation of specialized food service software have on hospital food service departments' efficiency?

- Purchasing
 - No perceived benefit to changing purchasing process using the new system. None of the sites modified their purchasing procedures.
- Patient trayline
 - The computer software had a varied effect on trayline operations
 - The format and design of the patient meal tickets was not uniform
- No consistent effect on efficiency

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Results and Discussion

3. What factors were identified by the food service staff and directors as barriers and/or facilitators regarding the implementation of specialized foodservice software?

Barriers

- Poorly Defined Vision
- Lack of Support, Tools, resources
- Deficiency of Skills and Knowledge
- Implementation Timeline
- Database
- Lack of needed Equipment
- Employee Emotional Barriers
- Software Functionality
- Written Division Menu
- Department Specific Barriers

Facilitators

- Leadership
- Commitment of employees to their patients
- Cheerleading
- Registered Dietitian engagement in the process
- Awareness
- Management of the process
- Employee Characteristics
- Ability of the diet office staff to learn
- Tools and resources available

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Results and Discussion

6. What effect does the addition of specialized food service software have on patient satisfaction as measured through the Press-Ganey HCAHPS® survey?

- Four of five sites experienced a decrease in patient satisfaction during the quarter of implementation.
 - Site 1's Foodservice Director (FSD) added a room service program to a hospital unit during the implementation. The FSD concluded the functionality of the software provided an opportunity to add room service.
 - Site 5's FSD was running a room service program prior to implementation. The FSD concluded the functionality of the software was not adequate to continue with the room service menu.
- Interviewees perceived the software had varying effect on patient satisfaction.
- The range of patient satisfaction "very good" scores decreased from pre-implementation to post-implementation.
 - A standardized patient menu was implemented along with the software implementation.

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Results and Discussion

6. What effect does the addition of specialized food service software have on patient satisfaction as measured through the Press-Ganey HCAHPS® survey?

Chart 3

PATIENT SATISFACTION PRESS-GANEY "VERY GOOD" SCORES*

	Site 1	Site 2	Site 3	Site 4	Site 5
2nd Quarter Pre-Implementation	23.00	43.00	25.30	26.00	30.10
1st Quarter Pre-Implementation	23.50	45.50	27.00	28.80	34.00
2nd Quarter Post-Implementation	29.90	42.70	21.50	28.00	27.00
1st Quarter Post-Implementation	31.00	40.00	22.00	24.60	28.60
2nd Quarter Post-Implementation	33.60	37.10	33.10	27.00	28.90

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Results and Discussion

6. What effect does the addition of specialized food service software have on patient satisfaction as measured through the Press-Ganey HCAHPS® survey?

Chart 4

PATIENT SATISFACTION PRESS-GANEY "VERY GOOD" SCORES

Site	Pre-Implementation Ave	Post-Implementation Ave
Site 1	29.95	32.3
Site 2	44.25	40.5
Site 3	26.5	32.55
Site 4	27.4	25.8
Site 5	32.0	28.25

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Results and Discussion

8. What is the attitude of hospital food service employees toward the perceived benefit and adoption of technology for personal and work use?

Table 3 TRI 2.0 Questionnaire Results (N = 103)

Statement	Mean ^a	Std. Deviation
Technology gives me more freedom of mobility	3.94	.99
I keep up with the newest technology in my area of interest.	3.80	.66
Technology makes me more productive in my life.	3.74	.88
Technical support lines (help lines) are not helpful because they don't explain things in a way I understand ^b	3.32	.99
Other people come to me for advice on new technologies	3.29	.94
Sometimes, I think that technology systems are not designed for use by regular people ^b	3.28	.99
Too much technology distracts people to a point that is harmful ^a	2.89	1.08
Technology lowers the quality of relationships by reducing personal interaction ^a	2.74	1.08
In general, I am among the first in my circle of friends to acquire new technology	2.69	.95
People are too dependent on technology to do things for themselves ^a	2.53	1.00

^a Bolded statements are negatively worded items; negatively worded items were reversed coded. The means reported for the bolded statements reflect the reverse coding.
^b 5 point Likert scale 1 = Strongly Disagree; 5 = Strongly Agree

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Conclusions and Practical Applications

- The necessity of a vision.
- Involvement of the registered dietitians in the process did not improve the implementation process; however, those diet offices were operating at a higher level and understood the software at a greater depth.
- When multiple layers of an organization and an outside company are involved in an implementation, having defined roles and responsibilities is needed.

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Conclusions and Practical Applications

- When a change is occurring the foodservice directors must own the process.
- Include the end users and the foodservice directors in the process of building and designing the customizable parts of the software.
- A skills inventory of the diet clerks pre-implementation is needed, so knowledge and skills can be developed prior to the use of the software.
- Hospital foodservice employees are willing to adopt technology

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Limitations and Future Research

- Study took place in five hospital foodservice departments undergoing a mandatory implementation of specialized software. The hospitals belonged to one corporate division within a for-profit healthcare corporation.
- The study followed one software program. Other software programs are available for use in hospital foodservice.
- Future research:
 - Investigate an implementation of specialized software into a hospital foodservice department that chose to adopt the software.
 - Follow an implementation in a non-profit hospital
 - Study the implementation of another software program
 - Investigate an implementation of the same software in another division within the same corporation in which recommendations from this study were implemented.
 - Study the impact the written patient menu has on patient satisfaction

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