

Sample Recommendation Report

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Sample Recommendation Report

The following example is the recommendation report on the tablet project proposed in [Chapter 16](#). The progress report for this project appears in [Chapter 17](#).

Transmittal “letters” can be presented as memos.

The writers include their titles and that of their primary reader. This way, future readers will be able to readily identify the reader and writers.

The subject heading indicates the subject of the report (the tablet study at RRMC) and the purpose of the report (recommendation report).

The purpose of the study. Notice that the writers link the recommendation report to the proposal, giving them an opportunity to state the main tasks they carried out in the study.

The methods the writers used to carry out the research.

The principal findings: the results and conclusions of the study. Notice that the writers state that they cannot be sure whether the technical information they have found is accurate. Is it okay to state that you are unsure about something? Yes, as long as you then propose a way to become sure about it.

 Rawlings Regional Medical Center
7500 Bannock Avenue
Rawlings, MT 59211

Date: December 14, 2013
To: Jill Bremerton, M.D.
Chief Executive Officer
Rawlings Regional Medical Center
From: Jeremy Elkins, Director of Information Technology
Eloise Carruthers, Director of Nursing
Rawlings Regional Medical Center
Subject: Recommendation Report for the Tablet Study at RRMC

Attached is the report for our study, "Selecting a Tablet Computer for the Clinical Staff at Rawlings Regional Medical Center: A Recommendation Report." We completed the tasks described in our proposal of October 6, 2013: familiarizing ourselves with tablet use by clinical staff in hospitals across the country, assessing RRMC clinical staff's knowledge of and attitudes toward tablet use, studying different models for administering tablet use, determining the criteria by which we might evaluate tablets, and performing the evaluations.

To carry out these tasks, we performed secondary and primary research. We studied the literature on tablet use, distributed a questionnaire to RRMC clinical staff who own tablets, and interviewed Dr. Bremerton. Then, we collected and analyzed our data and wrote the report.

Our main findings are that the clinical staff who already own tablets are very receptive to the idea of using tablets in a clinical setting and slightly prefer having the hospital supply the tablets. We, too, think the hospital-supplied model is preferable to the bring-your-own-device (BYOD) model. Although the best tablets for our needs would be those designed and built for health-care applications, those are too expensive for our budget. Because reports on the technical characteristics of computer products are notoriously unreliable, we cannot be sure whether the many

The major recommendation. The writers ask their supervisor if she will reconsider whether the hospital can afford tablets specifically designed for health-care environments. That's not insubordination. Just be polite about it.

A polite offer to participate further or to provide more information.

Letter to Jill Bremerton, M.D.
December 14, 2013
page 2

general-purpose tablets can meet our standards for ease of disinfection or durability, and we are not sure whether they have sufficient battery life.

We recommend one of two courses of action: reconsidering the cost criterion or testing a representative sample of general-purpose tablets for disinfection and the other technical characteristics and letting the clinical staff try them out.

We appreciate the trust you have shown in inviting us to participate in this phase of the feasibility study, and we would look forward to working with you on any follow-up activities. If you have any questions or comments, please contact Jeremy Elkins, at jelkins@rrmc.org or at 444-3967, or Eloise Carruthers, at ecarruthers@rrmc.org or at 444-3982.

A good title indicates the subject and purpose of the document. One way to indicate the purpose is to use a generic term—such as *analysis*, *recommendation*, *summary*, or *instructions*—in a phrase following a colon. For more about titles, see "[Writing Clear, Informative Titles](#)."

The names and positions of the principal reader and the writers of the document.

The date the document was submitted.

The name or logo of the writers' organization often is presented at the bottom of the title page.

• **Selecting a Tablet Computer for
the Clinical Staff at
Rawlings Regional Medical Center:
A Recommendation Report**

Prepared for: Jill Bremerton, M.D.
Chief Executive Officer
Rawlings Regional Medical Center

Prepared by: Jeremy Elkins, Director of Information Technology
Eloise Carruthers, Director of Nursing

December 14, 2013



Rawlings Regional Medical Center
7500 Bannock Avenue
Rawlings, MT 59211

In the abstract, the title of the report is often enclosed in quotation marks because the abstract might be reproduced in another context (such as in a database), in which case the report title would be the title of a separate document.

Abstracts are often formatted as a single paragraph.

The background and purpose of the report.

The methods.

The major findings.

Note that the writers provide some technical information about tablet use, clinical staff attitudes, and technical characteristics of tablets.

The major recommendations.

A keywords list ensures that the report will appear in the list of results of an electronic search on any of the terms listed.

Abstract

"Selecting a Tablet Computer for the Clinical Staff
at Rawlings Regional Medical Center:
A Recommendation Report"

Prepared by: Jeremy Elkins, Director of Information Technology
Eloise Carruthers, Director of Nursing

On October 8, 2013, Dr. Jill Bremerton, Chief Executive Officer of Rawlings Regional Medical Center (RRMC), approved a proposal by Jeremy Elkins (Director of Information Technology) and Eloise Carruthers (Director of Nursing) to carry out a feasibility study on integrating tablet computers into the RRMC clinical setting and to report their findings. The authors began by performing research to better understand how tablets are being used by clinical staff in hospitals across the country. Then, they assessed RRMC clinical staff attitudes toward tablet use, studied two models for administering use of tablets in hospitals, determined the criteria by which tablets might be evaluated, and performed the evaluations. RRMC clinical staff who already own tablets are very receptive to the idea of using tablets in a clinical setting and slightly prefer having the hospital supply the tablets. The best tablets for RRMC needs are those designed and built for health-care applications because they meet hospital standards for disinfection, are durable, and offer numerous hardware and software options, such as barcode scanners, RFID readers, speech input, and smart-card readers. Unfortunately, they are too expensive for our budget. Because there are numerous health-care apps available for not only the iPad but also the many Android tablets and Windows-based tablets, any of these that meet our other needs would be acceptable. However, we are not sure whether the many general-purpose tablets can meet our standards for ease of disinfection or ruggedness, and we are not sure whether they have sufficient battery life. We recommend that, if we cannot reconsider the cost criterion, we test a representative sample of general-purpose tablets for disinfection and the other technical characteristics that would affect their usefulness in the clinical setting.

Keywords: tablets, health care, HIPAA, disinfection, iPad, Android, Windows, rugged, durability

Note that the typeface and design of the headings in the table of contents mirror the typeface and design of the headings in the report itself.

In this table of contents, the two levels of headings are distinguished by type style (boldface versus italic) and indentation.

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The executive summary describes the project with a focus on the managerial aspects, particularly the recommendation. Note the writers' emphasis on the problem at RRMC.

Here the writers present a brief statement of the subject of their report.

The background of the feasibility study that Dr. Bremerton is funding.

A brief statement of the methods the writers used to carry out their research. Note that throughout this report the writers use the active voice ("We studied the literature . . ."). See [Ch. 10](#) for more on the active voice. Note, too, that the discussion of the methods is brief: most managers are less interested in the details of the methods you used than in your findings.

Findings are the important results and conclusions of a study.

Note that the writers use the word *recommend*. Using key generic terms such as *problem*, *methods*, *results*, *conclusions*, and *recommendations* helps readers understand the role that each section plays in the document.

Because the executive summary is the report element addressed most directly to management, the writers make clear why they prefer looking again at whether the hospital can afford to purchase health-care-specific tablets.

1

Executive Summary

To determine the best way to integrate tablet computers into the RRMC clinical setting, Dr. Jill Bremerton, Chief Executive Officer, asked us to study national trends, determine clinical-staff attitudes, examine management models, devise criteria for assessing tablets, and present our findings and recommendations.

Currently, RRMC has no formal policy on tablet usage by clinical staff. By default, we are following a bring-your-own-device (BYOD) approach. More than half of our clinical staff already use their personal tablets in their work. Dr. Bremerton wanted us to determine the best way to make tablets available to all our clinical staff. This charge included assessing the available tablets and recommending which tablet we should make available to our clinical staff.

To carry out this study, we completed the tasks described in our proposal of October 6, 2013: we studied the literature on tablet use; distributed a questionnaire to every member of the RRMC clinical staff, requesting responses from those who own tablets; and interviewed Dr. Bremerton. Then, we collected and analyzed our data and wrote the report.

Our main finding is that the clinical staff who already own tablets are very receptive to the idea of using tablets in a clinical setting. Not one of these staff members thought we should not use tablets in the clinical setting. By a slight margin, these staff members prefer having the hospital supply the tablets. We, too, think the hospital-supplied model is preferable to the BYOD model because it will reduce the chances of privacy violations and streamline the work of the IT department. We concluded, too, that the best tablets for our needs are those designed and built for health-care applications. Unfortunately, they are too expensive for our budget. And we cannot be sure, simply from reading the literature, whether the many general-purpose tablets can meet our standards for ease of disinfection or durability. Nor can we be sure whether they have sufficient battery life. Any of the general-purpose tablets, regardless of operating system or brand, would be adequate if it met these standards.

We recommend one of two courses of action: reconsidering our cost criterion or testing a representative sample of general-purpose tablets for disinfection and the other technical characteristics and making suitable tablets available for clinical staff to demo. We believe reconsidering the cost criterion is the better approach for our needs because the health-care-specific tablets offer significant advantages over the general-purpose tablets.

Some organizations require that each first-level heading begin on a new page.

A brief statement of the context for the report.

Note that the word *currently* is used to introduce the background of the study: the current situation is unsatisfactory for several reasons.

A formal statement of the task the committee was asked to perform. The writers paraphrase from the memo Dr. Bremerton gave them. Often in technical communication, you will quote or paraphrase words your reader wrote to you. This practice reminds the reader of the context and shows that you are carrying out your tasks professionally.

The writers incorporate a brief overview of their methods into the list of tasks.

The writers devote two paragraphs to their principal findings. The introduction can present the major findings of a report; technical communication is not about drama and suspense.

Introduction

- To determine the best course of action for integrating tablet computers into the RRMC clinical setting, Dr. Jill Bremerton, RRMC Chief Executive Officer, asked us to study national trends, determine clinical-staff knowledge of and attitudes toward tablets, examine administrative models for tablet use, devise criteria for assessing tablets, and present our findings and recommendations.
- Currently, RRMC has no formal policy on tablet usage by clinical staff. By default, we are following a bring-your-own-device (BYOD) approach. More than half of our clinical staff use their personal tablets in their work. This situation is not ideal because not all clinical staff are taking advantage of the enormous potential for improving patient care and reducing costs by using tablets, and IT is struggling to keep up with the work needed to ensure that all the different tablets are working properly and that any information-security protocols required by HIPAA and the Affordable Care Act are not being violated.
- Therefore, Dr. Bremerton wanted us to determine the best way to make tablets available to all our clinical staff. Specifically, Dr. Bremerton asked us to perform five tasks:
 - Determine how tablets are being used by clinical staff across the nation. We performed secondary research to complete this task.
 - Determine the RRMC clinical staff's current knowledge of and attitudes toward tablet use. To complete this task, we wrote and distributed a survey to clinical staff who already own tablets.
 - Determine how hospitals administer the use of tablets in a clinical setting. We performed secondary research to complete this task.
 - Establish criteria by which we might evaluate tablets for RRMC. We performed secondary research to complete this task. In addition, we interviewed Dr. Bremerton for her suggestions about the most-important criterion.
 - Assess available tablets based on our criteria. We performed secondary research to complete this task.
- We found that tablet use in clinical settings is increasing quickly, and that clinical staff are finding many ways to use tablets to improve care and save time and money. Among the clinical staff at RRMC who already own

Notice the writers' use of the phrase "we recommend." Repeating key terms in this way helps readers understand the logic of a report and concentrate on the technical information it contains.

An advance organizer for the rest of the report.

tablets, nearly half own an iPad and nearly half an Android tablet, most consider themselves expert users of their tablets, and more than two-thirds already use them in the clinical setting; by a slim margin, they would prefer a hospital-supplied model for tablet use to a BYOD model. Our research on the two models for making tablets available also found more advantages and fewer disadvantages to the hospital-supplied model.

Our principal finding regarding tablets themselves is that the best tablets for our use would be those designed and built for health-care applications. These tablets are rugged and easy to disinfect, and they offer a wealth of hardware and software options that would streamline our daily tasks without introducing any risks either to patient care or to data privacy. Unfortunately, purchasing enough of these tablets for all clinical staff would exceed our budget. To determine whether any of the general-purpose tablets meet all our needs, we would need to conduct hands-on testing regarding disinfection, battery life, durability, and several other technical criteria.

We recommend, first, that we reassess whether the budget will permit consideration of any of the health-care-specific tablets. If that is not possible, we recommend that we ask manufacturers of a small set of general-purpose tablets to let us test their products and invite our clinical staff to demo them. This option would yield data that would help us decide how to proceed.

In the following sections, we provide additional details about our research methods, the results we obtained, the conclusions we drew from those results, and our recommendation.

The writers use the same task organization as in the proposal and the progress report.

Research Methods

We began our research by interviewing Dr. Bremerton, who emphasized that we need to maintain our focus on our priorities—patient care and service to the community—and not let technical questions about the tablets distract us from the needs of our clinical staff. “We’re not going to do anything without the approval of the doctors and nurses,” she said.

Early on in our research, we discovered an article that corroborated what Dr. Bremerton had told us (Narisi, 2013). Two keys to doing the research were to focus on security features—data-privacy issues mandated in HIPAA and in the Affordable Care Act—and to get the clinical staff’s input.

To perform the analysis requested by Dr. Bremerton, we broke the project into six tasks:

1. acquire a basic understanding of tablet use by clinical staff across the nation
2. determine the RRMC clinical staff’s knowledge of and attitudes toward tablet use
3. assess the BYOD and hospital-owned tablet models
4. establish criteria for evaluating tablets
5. assess available tablets based on our criteria
6. analyze our data and prepare this recommendation report

In the following discussion of how we performed each task, we explain the reasoning that guided our research.

- ***Task 1. Acquire a basic understanding of tablet use by clinical staff across the nation***

Dr. Bremerton pointed us to a number of resources on tablet use in clinical settings. In addition, we conducted our own literature review. Most of the research we studied fell into one of four categories:

- general introductions to tablet use in trade magazines and general-interest periodicals
- more-focused articles about tablets used in health care
- technical specifications of tablets provided in trade magazines and on manufacturers’ websites
- trade-magazine articles about best practices for managing the use of tablets in clinical settings

By stating that they know that their sources are a mixture of different kinds of information, not all of which is equally useful for every kind of question that needs to be answered, the writers suggest that they are careful analysts.

The writers carefully explain the logic of their methods. Do not assume that your readers will automatically understand why you did what you did. Sometimes it is best to explain your thinking. Although technical communication contains a lot of facts and figures, like other kinds of writing it relies on clear, logical arguments.

As discussed in "[Conducting Primary Research](#)," some questions will misfire. Therefore, it is smart to field-test a questionnaire before you distribute it.

Including a page number in the cross reference to the appendix is a convenience to the reader. When you do so, remember to add the correct page number after you determine where the appendix (or the several appendixes) will appear in the report.

5

As we expected, the information we acquired was a mix of user opinions, benchmark-test results, and marketing. We relied most heavily on case studies from hospital administrators and technical specialists in health IT. Because of the unreliability of information on manufacturers' websites, we were hesitant to rely on claims about product performance.

Task 2: Determine the RRMC clinical staff's knowledge of and attitudes toward tablet use

On October 14, 2013, we sent all 147 clinical staff members an email linking to a four-question Qualtrics survey. The email indicated that we were seeking opinions about tablet use by clinical-staff members who already own tablets and made clear that the survey would take less than two minutes to complete.

Initially, we considered collecting data from all 147 clinical staff members. However, as we constructed that survey, we realized that it would be cumbersome to gather and track information from three different populations: those who didn't own a tablet, those who owned one but didn't use it in the clinic, and those who owned one and did use it in the clinic. Eliciting information from these different groups would require a long, complex questionnaire and some statistical analysis to separate out the attitudes.

For this reason, we decided to address only the tablet owners, since we assumed that this group would constitute approximately two-thirds of the clinical staff (Drinkwater, 2013). With this streamlined focus, we were able to create a very brief survey, one that would likely yield a high return rate. We assumed, too, that the opinions expressed by current tablet owners would likely be of more value in helping us plan a formal program of tablet use than those of clinicians who were less likely to be experienced tablet users.

We field-tested the questionnaire with six clinical staff members, revised one of the questions, and then, with the authorization of Dr. Bremerton, uploaded the questionnaire to Qualtrics and sent an email to the clinical staff.

The questionnaire (including the responses) appears in the Appendix, page 19.

Note that the writers present their references to their sources throughout the report.

Here, again, the writers explain the logic of their methods. They decided to rely on the experiences of hospital administrators. This approach will likely appeal to Dr. Bremerton.

Often you will begin your project with a cost criterion: your recommended solution must not cost more than a certain amount.

The writers present just enough information about the technologies to help the reader understand their logic. Writers sometimes present too much information; include only as much as your readers need to be able to follow your report.

Task 3. Assess the BYOD and hospital-owned tablet models

Our research revealed that hospitals use one of two administrative models for giving clinical staff access to tablets: the bring-your-own-device (BYOD) model and purchasing tablets to distribute to staff. To present the advantages and disadvantages of each of these models, we relied on reports from hospital administrators who pioneered these models (Jackson, 2011a, 2011b). For statistics on the popularity of each of these administrative models, we relied on a survey (Terry, 2011).

Task 4: Establish criteria for evaluating tablets

We both studied the voluminous literature on tablets. Jeremy Elkins met informally with his five IT colleagues to discuss the data, and Eloise Carruthers met informally with her nursing staff and with selected physicians, including several who had responded to the survey.

- We began with the first criterion: cost. Dr. Bremerton had told us in our interview that the budget for the project (assuming that RRMC would supply a tablet to each of the 147 members of the clinical staff) would be \$800 per device, fully configured with any commercial software needed to operate it. For this reason, we did not conduct a thorough examination of the health-care-specific tablets, each of which costs \$2,500–3,000.

In addition, we paid particular attention to the complexities of the current tablet market, focusing on whether the various devices would work seamlessly with our health-records system and other security features ("Top Five," 2013), on the need to be able to disinfect the tablets (Carr, 2011), and on durability (Narisi, 2013). We knew from experience with all kinds of portable information technology that the question of battery life would be problematic because it can vary so much depending on load and other factors.

- We concluded that two factors that might seem critically important were not: operating system and availability of relevant apps. Although the Apple iPad is the single most popular tablet, the Samsung Galaxy and other Android tablets are currently outselling iPads. As a result, all the important apps are being created for the Apple operating system (iOS), for Android, and for Windows (the OS used by the Microsoft Surface and the major health-care-specific tablets).

Because analyzing their data and writing this report is part of the study, it is appropriate to include it as one of the steps. In some organizations, however, this task is assumed to be part of the study and is therefore not presented in the report.

Task 5. Assess available tablets based on our criteria

Because our budget did not permit us to recommend the tablets designed for the health-care industry, we decided not to study them in detail.

To study the general-purpose tablets, we relied on trade magazines. We soon realized, however, that several of our necessary criteria—namely, the ability to disinfect the tablet, as well as durability and battery life—were not adequately addressed in the literature because our needs as a hospital are so specific.

For instance, battery life is typically reported as the mean number of hours the battery will last. But that figure varies significantly, depending on the applications the device is running. In addition, there is the question of whether the device is hot-swappable (that is, whether the battery can be replaced without shutting down the device). However, some tablets boot very quickly, making this characteristic less important. Finally, there is an administrative question: will the clinical staff member use the same tablet every day or check one out at the start of each shift (or perhaps check out a second or even a third one during a 14-hour shift)? Will fresh batteries be available only in one location, or can they be checked out at several locations? Can a staff member grab a handful of fresh batteries at the start of a shift? All these questions bear on how we would need to think about the importance of battery life.

For this reason, we recommend that a representative sample of general-purpose tablets be evaluated for disinfection, durability, and battery life and that this study include a substantial on-site evaluation period at RRMC.

Task 6. Analyze our data and prepare this recommendation report •

We drafted this report and uploaded it to a wiki that we created to make it convenient for the other IT staff members and interested clinical staff members to help us revise it. We incorporated most of our colleagues' suggestions and then presented a final draft of this report on the wiki to gather any final editing suggestions.

The writers present an advance organizer for the results section.

Results

- In this section, we present the results of our research. For each of the tasks we carried out, we present the most important data we acquired.

Task 1. Acquire a basic understanding of tablet use by clinical staff across the nation

Since the introduction of the Apple iPad in 2010, the use of tablets by clinical staff in hospitals across the country has been growing steadily. Although there are no precise statistics on how many hospitals either distribute tablets to clinical staff or let them use their own devices in their work, the number of articles in trade magazines, exhibits at medical conferences, and discussions on discussion boards suggests that tablets are quickly becoming established in the clinical setting. And many hundreds of apps have already been written to enable users to carry out health-care-related tasks on tablets.

The most extensive set of data on tablets in hospitals relates to the use of the iPad, the first tablet on the market. Ottawa Hospital has distributed more than 1,000 iPads to clinical staff; California Hospital is piloting a program with more than 100 iPads for hospital use; Kaiser Permanente is testing the iPad for hospital and clinical workflow; and Cedars-Sinai Medical Center is testing the iPad in its hospital. The University of Chicago's Internal Medicine Residency Program uses the iPad; the iPad is also being distributed to first-year medical students at Stanford, University of California-Irvine, and University of San Francisco. In addition, there are reports of Windows-based and Android-based tablets being distributed at numerous other hospitals and medical schools (Husain, 2011).

Today, tablets have five main clinical applications (Carr, 2011):

- *Monitoring patients and collecting data.* Clinical staff connect tablets to the hospital's monitoring instruments to collect patient information and transfer it to patients' health records without significant human intervention. In addition, staff access patient information on their tablets.
- *Ordering prescriptions, authorizations, and refills.* Clinical staff use tablets to communicate instantly with the hospital pharmacy and off-site pharmacies, as well as with other departments within the hospital, such as the Imaging Department.

The writers continue to use the task structure that they used in the methods section.

- *Scheduling appointments.* Clinical staff use tablets to schedule doctor and nurse visits and laboratory tests, to send reminders, and to handle re-scheduling and cancellations.
- *Conducting research on the fly.* Clinical staff use tablets to access medication databases and numerous reference works.
- *Educating patients.* Clinical staff use videos and animations to educate patients on their conditions and treatment options.

Tablets provide clinical staff with significant advantages. Staff do not need to go back to their offices to connect to the Internet or to the hospital's own medical-record system. Staff save time, reduce paper usage, and reduce transcription errors by not having to enter nearly as much data by hand.

Task 2: Determine the RRMC clinical staff's knowledge of and attitudes toward tablet use •

On October 14, 2013, we sent all 147 clinical staff members an email linking to a four-question Qualtrix survey. In the email, we said that we were seeking opinions about tablet use by clinical-staff members who already own tablets and made clear that the survey would take less than two minutes to complete.

We received 96 responses, which represents 65 percent of the 147 staff members. We cannot be certain that all 96 respondents who indicated that they are tablet owners in fact own tablets. We also do not know whether all those staff members who own a tablet responded. However, given that some 75 percent of physicians in a 2013 poll own tablets, we suspect that the 96 respondents reasonably accurately represent the proportion of our clinical staff who own tablets (Drinkwater, 2013).

Here are the four main findings from the survey of tablet owners:

- Some 47 percent of respondents own an Apple iPad, and 47 percent own either a Samsung Galaxy or another tablet that uses the Android operating system. Only 6 percent use the Microsoft Surface, one of the several Windows-based tablets.
- Some 58 percent of the respondents strongly agree with the statement that they are expert users of their tablets. Overall, 90 percent agree more than they disagree with the statement.

- Some 63 percent of respondents use their tablets for at least one clinical application. They have either loaded apps on their tablets themselves or had IT do so for them.
- Some 27 percent of the respondents would prefer to continue to use their own tablets for clinical applications, whereas 38 percent would prefer to use a tablet supplied by RRMC. Some 35 percent had no strong feelings either way. None of the respondents indicated that they would prefer not to use a tablet at all.

Task 3. Assess the BYOD and hospital-owned tablet models

Currently, hospitals use one of two models for giving clinical staff access to tablets: the bring-your-own-device (BYOD) model and the purchase model, whereby the hospital purchases tablets to distribute to staff. In this section, we will present our findings on the relative advantages of each model.

The BYOD model is based on the fact that, nationally, some three-quarters of physicians already own tablets (with the Apple iPad the single most popular model) (Drinkwater, 2013). We could find no data on how many nurses own tablets.

The main advantage of the BYOD model is that clinical staff already know and like their tablets; therefore, they are motivated to use them and less likely to need extensive training. In addition, the hardware costs are eliminated (or almost eliminated, since some hospitals choose to purchase some tablets for staff who do not own their own). Todd Richardson, CIO with Deaconess Health System, Evansville, Indiana (Jackson, 2011b), argues that staff members who own their own tablets use and maintain them carefully: they know how to charge, clean, store, and protect them. In addition, the hospital doesn't have to worry about the question of liability if staff members lose them during personal use. And if the staff member moves on to a new position at a different hospital, there is no dispute about who owns the information on the tablet. All the hospital has to do is disable the staff member's account.

However, there are three main disadvantages to the BYOD model:

- Some clinical staff do not have their own tablets, and some who do don't want to use them at work; to make the advantages of tablet use

- available to all the clinical staff, therefore, the hospital needs to decide whether to purchase tablets and distribute them to these staff members.
- Labor costs are high because each tablet needs to be examined carefully by the hospital IT department to ensure that it contains no software that might interfere with or be incompatible with the health-care software that needs to be loaded onto it. This labor-intensive assessment by IT can seriously erode the cost savings from not having to buy the tablet itself.
 - Chances of loss increase because the staff member is more likely to use the tablet at home as well as in the hospital.

The other model for making tablets available to clinical staff is for the hospital to purchase the same tablet for each staff member.

The purchase model offers two distinct advantages, as described by Dale Potter, CIO of 1,300-bed Ottawa Hospital in Ontario, Canada. Potter has purchased more than 2,000 iPads for his staff (Jackson, 2011a):

- The hospital controls the software and apps loaded on the tablets and can even create its own apps. For instance, Potter hired 120 developers to create apps.
- The hospital reduces labor costs because IT can load exactly the same set of apps and other software on each machine. Updates and upgrades also are far simpler to manage when all the devices are the same.

The main disadvantages of the purchase model are the following:

- Staff members might not like the tablet that the hospital chooses.
- Staff members might need to be trained to use the tablet.
- Liability issues related to loss of the tablets must be addressed officially in the employment contract between the hospital and the staff member.

Beginning in 2010 with the introduction of the iPad, most hospitals used the BYOD model; clinical staff brought their own tablets to work and started to think about ways to use them in a clinical setting. As time passed, however, and more people began to acquire tablets from different manufacturers, hospitals began to see the advantages of standardizing tablet use. A 2011 survey (Terry, 2011) showed that 40 percent of hospitals use the BYOD model, whereas 55 percent of hospitals support only devices provided or owned by the institution.

Task 4: Establish criteria for evaluating tablets

Our interview with Dr. Bremerton, as well as our research in the available literature, yielded four *necessary* criteria and three *desirable* criteria for tablet use at RRMC.

A tablet that does not meet a necessary criterion would be eliminated from consideration. The four necessary criteria are the following:

- *Cost.* Each device must cost less than \$800, fully configured for use.
- *HIPAA compliance.* We cannot use any device or technology that would jeopardize our compliance with the HIPAA and Affordable Care Act privacy standards for medical information. What this means, in essence, is that a tablet must operate seamlessly with our electronic health-records system, Cerner, which we access through our current utility, Citrix. The tablet must duplicate our current desktop and remote-access capabilities.
- *Other security features.* The tablet must support basic security features, including encryption, remote wipe (IT's ability to remove data on a lost tablet), auto-lock (that cannot be turned off except by IT), and perimeter settings (IT's ability to prevent use of a tablet that has strayed a certain distance from the server) ("Top Five," 2013).
- *Ease of disinfection.* Because the tablets would be used in a clinical setting, they would be subject to the same standards of disinfection as any other equipment or device. A tablet that cannot be disinfected effectively and easily would not be an appropriate choice (Carr, 2011).

In addition, we have established four other criteria against which to evaluate tablets. We have deemed these criteria desirable; a tablet that does not meet a desirable criterion would not be eliminated from consideration.

- *Durability.* Because the tablet would be carried around within the hospital and sometimes would be used in close quarters, it likely would be dropped or bumped. The more durable, the more desirable the tablet would be.
- *Long battery life.* Our clinical staff routinely work shifts as long as 14 hours. The longer the battery life, the better. Related to battery life is the hot-swap feature. In a hot-swappable device, the battery can be removed and replaced with a fresh one without having to shut down the tablet.

Task 5. Assess available tablets based on our criteria

One challenge we faced is that it was impractical to do a comprehensive assessment of all of the approximately 100 tablets available on the market. A second challenge is that tablets fall into a dizzying variety of sometimes overlapping categories. For example, the single most popular tablet is the Apple iPad, which runs on Apple's proprietary operating system. Many other tablets run on the Android system. Some, like the Amazon Kindle Fire, run on specialized configurations of Android. And Microsoft's Surface runs on Windows. There are general-purpose tablets, like the Samsung, made for the consumer market, and there are specialized tablets, like the Motion, designed for the health-care industry (Phillips, 2013). There are rugged tablets designed to meet military specifications for durability. Some tablets have USB ports for easy connection to existing clinical instruments and devices, as well as specialized features such as barcode-reading and RFID capabilities. Some tablets come with dozens of native (pre-installed) apps related to health care.

In short, although many brands of tablet are similar, no two are identical. As a result, we decided to review a small set of tablets that are mentioned frequently in health-care magazines and journals. We were sure to include the iPad, the Microsoft Surface, and several Android tablets. We also looked briefly at several tablets specially designed and marketed for health-care applications.

We present our basic findings by returning to our set of necessary and desired criteria.

The four necessary criteria are the following:

- **Cost.** Unfortunately, our cost criterion of \$800 per unit eliminates all the tablets designed for health-care applications. These tablets, which cost between \$2,500 and \$3,000, are easy to disinfect and highly durable and include many desirable features such as barcode scanners, RFID readers, speech, and smart-card readers. The leading tablets in this category are the ProScribe Medical Tablet PC, the Sahara Slate PC, the MediSlate MCA, the Motion C5v Medical Tablet PC, the Teguar TA-10 Medical Tablet PC, the Advantech Medical PC, and the Arbor Antibacterial Medical Tablet.
- **HIPAA compliance.** All of the tablets we reviewed would enable us to remain in compliance with HIPAA and ACA, and all would enable us to use our current record system, Cerner, through our Citrix utility. Some of the tablets have native apps to support this access, whereas others use virtual private networks.

- *Other security features.* All of the tablets we reviewed would support the basic security features we identified, although some tablets would be easier than others for IT to configure.
- *Ease of disinfection.* This proved to be a very challenging criterion to assess. On the one hand, all of the so-called ruggedized tablets, as well as all those designed for health care, met this criterion because all the surfaces are sealed. On the other hand, the general-purpose tablets were not designed to withstand medical-grade disinfectants. However, this does not necessarily mean that they would not withstand clinical disinfection. According to John Curin, head of the health-care practice at Burwood, an IT consulting firm, “I couldn’t disinfect [an iPad] if I wanted to.” By contrast, Dr. John Halamka, the CIO of Beth Israel Deaconess Medical Center in Boston, argues that the iPad is “completely disinfectable.” Even though Apple advises against using a disinfecting solution on the iPad, Halamka says he does so and has experienced no problems (Carr, 2011).

On the basis of the cost criterion, we must eliminate all the health-care-specific tablets and study only the general-purpose tablets. We need to devise a method to determine whether any of the general-purpose tablets can be adequately disinfected. For the purposes of this study, however, we decided to assess a representative subset of the general-purpose tablets based on our desirable criteria.

We will now present our major findings regarding the desirable criteria: durability and long battery life. We have decided against presenting a decision matrix because some of the technical characteristics are either imprecise or unknowable. For instance, battery life is a notoriously difficult characteristic to measure, because it can be affected greatly by so many factors.

Our tentative findings are that the Apple iPad, the Samsung Galaxy and the many other Android tablets, and the Microsoft Surface appear to meet our two desirable criteria. We would need to carry out our own tests of these tablets, configured with our software and appropriate apps, to determine their battery life. And we would need to determine whether any of the aftermarket protective cases would provide adequate durability. Rugged and waterproof iPad cases are available from Hard Candy Cases, OtterBod, and others. There are also waterproof solutions that are said to sterilize the iPad. In addition, there are some protective cases said to be designed specifically for clinical environments.

The function of a conclusion is to explain what the data mean. Here the writers explain how their results can help their readers determine how to proceed with the tablet study. Notice that a conclusion is not the same as a recommendation (which explains what writers think should be done next).

The writers present an advance organizer for the results section.

At this point in the report, the writers have decided to abandon the “task” labels. Their thinking is that they are focusing less on what they did and more on the meaning of the information they gathered. However, they retain the headings that help readers understand the topic they are discussing.

15

Conclusions

In this section, we present our conclusions based on our research related to the four questions we were asked to answer.

Tablet use by clinical staff

On the basis of our research, we conclude that increasing numbers of our clinical staff will begin to use tablets for more applications in a clinical setting. This increase will spur the creation of more health-care apps for all tablets.

The RRMC clinical staff's knowledge of and attitudes toward tablet use

On the basis of our survey of clinical staff who already own tablets, we conclude that they consider themselves proficient in using the tablets, and most already use them for at least one clinical application. Because they prefer the hospital-supplied model for tablet use, we conclude that they would welcome a formal plan to supply tablets.

The BYOD and hospital-owned tablet models

We conclude that the hospital-owned tablet model offers more advantages and fewer disadvantages than the BYOD model. Having all clinical staff use the same model of tablet saves money by streamlining the process of loading software and installing updates and upgrades. The medical center IT department can even create hospital-specific apps.

Criteria for evaluating tablets

Our first necessary criterion, cost, eliminated all the health-care-specific tablets from consideration, leaving us with only the general-purpose tablets. All the general-purpose tablets we evaluated met our HIPAA and ACA compliance and other security criteria. Unfortunately, because the general-purpose tablets are not designed for clinical settings, we could not determine from our research whether any of them are easy to disinfect. We would need to conduct our own tests to answer that question.

We would need to conduct our own testing to determine whether battery life and durability of any of the general-purpose tablets are acceptable.

Assessing available tablets based on our criteria

We drew two main conclusions from our study of available tablets:

- The best tablets for our use—the ones designed and intended for health-care settings—are out of our price range. Because they meet all our criteria, we should reassess whether our budget will permit us to assess them more carefully.
- Any one of the available general-purpose tablets is potentially acceptable (provided it meets the disinfection criterion). We see no compelling reason to favor one operating system over another. Apple iPads, Android tablets, and Windows tablets all come with acceptable power, and there are plenty of health-care apps available for each type. As Android machines establish their dominance over the iPad, health-care apps for Android devices will surpass those for the iPad in variety and number.

This recommendation states explicitly what the writers think the reader should do next. Note that they are sketching in ideas that they have not discussed in detail but that might interest their readers.

Recommendation

We recommend that the RRMC administration pursue one of two options:

Option 1: Reconsider the cost criterion

Although a health-care-specific tablet, at \$2,500–3,000, is some three times the cost of a general-purpose tablet, it offers distinct advantages in terms of disinfection properties, ruggedness, and availability of specialized hardware and software for better integration with our other devices and equipment.

If it is not possible to provide health-care-specific tablets to all clinical staff, we might consider a two-tiered system (some staff members receive a health-care-specific tablet, others a general-purpose one) or a phased-implementation system.

Option 2: Test a representative sample of general-purpose tablets •

If RRMC wishes to continue to assess the general-purpose tablets, we recommend that we contact manufacturers of the Apple iPad, the Samsung Galaxy, the Microsoft Surface, and several other Android tablets. We could request that they supply their most powerful products, equipped with the best set of medical apps, for our internal testing and evaluation.

We would then have IT test each tablet in a controlled environment for such technical characteristics as battery life and durability. We would also test each tablet for disinfection. Next, we would invite the manufacturers' representatives to attend a one- or two-day tablet fair, where we would make the products available to our clinical staff for demos and hands-on assessment. On the basis of these tests and follow-up questionnaires submitted by clinical staff, we would be in a good position to know how to proceed.

This list of references is written according to the APA documentation style, which is discussed in [Appendix, Part B](#).

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Presenting the percentage data in boldface after each question is a clear way to communicate how the respondents replied. Although most readers will not be interested in the raw data, some will.

Appendix: Clinical-Staff Questionnaire

This is the questionnaire we distributed to the 147 RRMC clinical staff members. We received 96 responses. The numbers in boldface below represent the percentage of respondents who chose each response.

Questionnaire on Tablet Use at RRMC

Directions: As you may know, Dr. Bremerton is conducting a study to determine whether to institute a formal policy on tablet use by clinical staff.

If you own a tablet device, please respond to the following four questions. Your opinions can help us decide whether and how to develop a policy for tablet use at RRMC. We greatly appreciate your answering the following four questions.

1. Which brand of tablet do you own?

- 47%** Apple iPad
28% Samsung Galaxy
9% Amazon Kindle Fire
6% Microsoft Surface
10% Other (please name the brand) (**Respondents named the Asus, Google Nexus, and a Toshiba model.**)

2. "I consider myself an expert user of my tablet."

Strongly disagree ____ **8%** **2%** **13%** **19%** **58%** Strongly agree

3. Do you currently use your tablet for a clinical application, such as monitoring patients or ordering procedures?

- 63%** Yes
37% No

4. If RRMC were to adopt a policy of using tablets for clinical applications (and to supply the appropriate software and training), which response best describes your attitude?

- 27%** I would prefer to use my own tablet.
38% I would prefer to use a hospital-supplied tablet.
35% I don't have strong feelings either way about using my own or a hospital-supplied tablet.
0% I would prefer not to use any tablet at all for clinical applications.

Thank you!