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HEALTHCARE IN THE UNITED STATES: FACTORS CONTRIBUTING TO ITS INCREASING COST

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ABSTRACT

The cost of healthcare in the United States is increasing. With costs increasing faster than inflation and growing at rates that approach 10% as compared to 2002, the nation is facing a healthcare crisis. Many factors are believed to have contributed to the overall rise in healthcare costs. Most of the issues can be identified and categorized into one or more of the following general categories: hospitals, physicians, prescription drugs, technology, labor shortage, and uninsurance. This study will endeavor to review those trends in healthcare and make recommendations as to which pose the greatest struggle for our national healthcare environment.

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ABSTRACT

According to the Centers for Disease Control and Prevention, over fifty-five percent of health care costs are a result of lifestyle health behaviors. These behaviors are extremely expensive in terms of health insurance costs.

The graduate program in health care administration program at King's College in Wilkes Barre, Pennsylvania was contacted by a local corporation with eight hundred employees to help the company reduce health care insurance costs. This employer was interested in reducing high-risk health behaviors practiced by its employees and hopefully, decrease health care costs.

A health survey was developed and administered to all employees in January 2003 to assess their perceptions about the health insurance plan offered by the company. It was also used to identify chronic diseases present in employees and to determine which high-risk health behaviors they practice.

The population was examined based on their demographic characteristics, the perceived impact of life style on health and their use of medical services. The goal was to shift the locus of control to the employer to improve the health of their employees.

The results of this survey were used to build a six part voice narrated Web- CT power point slide presentation on the most frequently practiced high-risk health behaviors by employees of this company. These slides are available to employees and their dependents twenty four hours a day and seven days a week. The effect of this intervention will be evaluated with a second survey next year.

ASSESSING EMPLOYEE ATTITUDES TOWARD HEALTH INSURANCE: RESULTS FROM A RECENT STUDY

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ABSTRACT

Researchers seeking to explore theoretical relationships involving benefit satisfaction, attitudes toward the company providing the benefits, and general attitudes toward the health care industry have not considered how attitudes toward the industry might affect benefit satisfaction. A large manufacturing company commissioned a study of employee attitudes toward its health and welfare benefit plans that includes measures of their attitude toward the industry as a whole. Over 90 percent of employees responded to the survey, providing a rich source of future inquiry. The paper provides an overview of the survey and initial work to assess measures of the three attitudes listed above. Suggestions for developing theory in this domain conclude the paper.

INTRODUCTION

Few would argue that the health care industry has problems at every level. Insurers (insurance companies), providers (doctors, hospitals, clinics, etc.), employees (who provide access to insurance to the majority of individuals), government agencies (Medicare, Medicaid, TennCare, etc.) and consumers all report deep concerns about the state of the industry (Abbott, 2003a). Each participant in the chain has its own concern.

Most research and commentary focuses on the problems facing plan designers, providers, and government agencies (need citation). Researchers have written considerably less about the challenges facing companies that strive to provide their employees with competitive, high quality benefit packages (Danehower & Lust, 1992). Abbott (2003b) suggests that benefits, particularly health insurance, are not as important as other components of total compensation but continue to be a critical element in an attractive total compensation package.

Ultimately, human resource managers still believe that, in spite of any negative perception of the industry as a whole, prospective employees consider benefit plans as a key component of overall compensation (Christopher, 2001). Many companies find that morale decreases when employees perceive that they are paying more money for reduced benefits. If, as traditional practice suggests, benefit plans have a significant impact on recruitment, retention, and overall job

satisfaction, then companies have a strong motive to determine how their employees perceive their benefit plan (Abbott, 2003b).

PURPOSE OF THE STUDY

Survey research provides both an opportunity to meet the needs of companies that want to stay abreast of their employees' benefit needs and as a chance to develop theoretical understanding of the relationship between benefits and more general attitudes. Recently, a large mid-south manufacturing company executed a company-wide study to accomplish these objectives.

At the time of the study, the company health insurance plan had two options. The Health Maintenance Organization (HMO) alternative allowed employees to pick from an approved network of physicians, hospitals, and specialists with increased costs for out-of-network treatment. This option was more restrictive, but it controlled out-of-pocket expenses for employees with a system of copays and low-level maximums for major procedures. The Preferred Provider Option (PPO) allowed participants to choose their own doctor while enjoying the benefits of copayments and other controls on out-of-pocket expenditures. It was more expensive than the HMO. The plan had been in place for two years at the time of this study.

The intent of the company's external consultant was to assist the company in designing programs to meet future needs. To that end, the consultant explored participant interest in add-on services and other optional benefit plans that might enhance the company's offering.

SURVEY DEVELOPMENT

The company funded the design, distribution, and analysis of an extensive survey that management distributed to all employees in the firm. The survey addressed the following objectives:

TABLE 1: RESEARCH AGENDA	
(i)	To determine employee attitudes toward the company's health insurance plan(s).
(ii)	To get employee feedback on the company's non-health insurance benefits.
(iii)	To poll participants on their preference between keeping benefits at current levels with a 50% premium increase versus reducing prescription drug benefits in order to keep the increase at 15%.
(iv)	To gauge the interest among employees for additional, employee-paid benefits such as cancer insurance, vision care, etc.
5.	To help the company understand how it might do a better job of providing a competitive health and welfare benefit package for employees at every level.

Participants provided the following demographic information: age (84% between 25 and 54), sex (79.2% male), family status (67.9% married; 58.4% with dependents under age 24), division,

position, health insurance status (55% HMO, 39% PPO, 6% no insurance), level of coverage, person who handles insurance claims, and reason for not using insurance plan (if applicable).

Of the company's approximately 2000 employees, 1950 returned surveys to the company. Of these, 126 were eliminated because of uninterpretable answers or failure to respond to a sufficient number of items to make the survey usable. The 1824 respondents (94% response rate; note that results appear as a percent of the sample) have the following characteristics, with detail in tables below.

ATTITUDE TOWARD HEALTHCARE INDUSTRY

The company believed that negative affect toward the industry may be having a deleterious effect on employee attitudes toward the health care plan. Table 7 shows a summary of results for each item.

Item	Mean
Costs higher than they should be	3.9
Quality lower than it used to be	3.2
Insurance companies make high profits	3.8
Government should intervene to reduce costs	3.4
Rising costs beyond the industry's control	2.8
Industry tries to keep costs down	2.5
Healthcare a basic right	4.1
Managed care has been good	3.2
Willing to pay more for good insurance	3.0
Willing to have more managed care	3.1

UNDERSTANDING OF HEALTHCARE PLAN

In this study, the survey asked employees the extent to which they understand specific components of the health care plan. The survey items differed somewhat between the HMO and PPO plans; these results appear in separate columns with the overall mean included for those items common to both plans. A comparison of the means between the two groups revealed significant differences in levels of understanding between the two plans on some of the items. When the mean

differs significantly (i.e. $p < .01$), an asterisk (*) appears beside the overall mean. The survey items appear in abbreviated form; the full survey is available upon request.

TABLE 3: UNDERSTANDING OF HEALTHCARE PLAN			
(Items Common to Both PPO and HMO, n=1704)			
Item	PPO	HMO	Overall
Lifetime maximum	2.90	2.71	2.79*
Amount of copayment	4.18	4.35	4.28*
Amount of company contribution	3.11	2.95	3.02
Preventive care	3.26	3.44	3.36*
Emergency room	3.23	3.57	3.43*
Inpatient hospital services	3.07	3.19	3.14
Prescription drugs (pharmacy)	3.90	3.88	3.89
90 day prescriptions (mail order)	3.33	3.28	3.30
Cost of generic vs. brand name drugs	4.11	4.12	4.11
Lab services	3.03	3.07	3.05
Maternity	2.40	2.52	2.47
Pre-admission process	3.07	2.90	2.97
Availability of specialists	3.46	3.02	3.20*
Overall Understanding	3.31	3.33	3.32
Items unique to PPO n=706)	Mean	(Items Unique to HMO n=998)	Mean
Choice among physicians	3.91	Primary care physician (PCP requirement)	4.29
Outside network costs	3.93	Specialist referral procedures	4.04
Deductible/Stop-loss choices	2.92	In-network requirement	3.82
PPO flexibility vs. HMO managed care	3.67	No payment for out-of-network service	3.07
Carrier discretion in treatment	2.90	\$25 drug copayment	3.65
Carrier review for medical necessity	2.80	HMO managed care vs. PPO flexibility	2.97
		PCP makes decisions on level of care	3.40
		Carrier makes some decisions about care	2.69

PERCEIVED QUALITY OF THE PLAN

The items measuring quality focus on the participants' actual experience with the health care plan. Fifteen items were common to both PPO and HMO participants. One item was unique to the PPO while four were unique to the HMO. Table 8 summarizes the means for each plan. Significant differences ($p < .01$) between HMO and PPO participants on common quality items appear with an asterisk next to the overall mean for that item.

TABLE 4: PERCEIVED QUALITY OF HEALTHCARE PLAN			
(Items Common to Both PPO and HMO, n=1704)			
Item	PPO	HMO	Overall
Quality of physicians available	2.77	2.90	2.84
Availability of qualified specialists	2.76	2.87	2.82
Quality of hospitals	2.86	3.03	2.96*
Accuracy of claims processing	2.70	2.87	2.80*
Carrier's helpfulness in solving claims problems	2.65	2.86	2.77*
Helpfulness of carrier's 800 number	2.80	3.01	2.93*
Helpfulness of carrier's Website	2.70	2.85	2.79
Quality of printed materials	2.91	3.13	3.04*
Speed of claims processing	2.77	2.93	2.86*
Dollar amount of copayments	3.11	3.29	3.21*
Comprehensiveness of coverage	2.94	3.11	3.04*
Ease of using the system	2.95	3.12	3.05*
Overall quality of plan	2.99	3.13	3.08*
Overall rating of health insurance plan	3.10	3.24	3.18*
(Items unique to PPO n=706)			(Items unique to HMO n=998)
Item	Mean		Item
Satisfaction with option selected	3.01		Level of out-of-pocket expenses
Satisfaction with PCP	3.43		
Decisions made by PCP	3.31		
Decisions made by carrier	2.96		

OVERALL SATISFACTION WITH BENEFIT PACKAGE

As the key component of an employee's benefit package, the health care plan heavily influences overall perceptions of the benefits the company offers employees. Table 9 summarizes the participants' overall satisfaction with the company's benefits.

TABLE 5: OVERALL BENEFIT SATISFACTION			
Item	Mean	Item	Mean
Company commitment to excellent benefits	3.88	HR Dept helpful with questions	3.68
Company pays fair portion of HI costs	3.75	Benefits superior to other companies	3.46
Choice between PPO and HMO	4.17	Benefits meet employees' needs	3.40
Current plan superior to previous plan	3.38	Benefits superior to competitors	3.45

ANALYSIS OF RESULTS

Management drew certain conclusions about the attitudes of this sample seem reasonable, even prior to more sophisticated analytical techniques (comparison of results by groups, data reduction, regression analysis, etc.). These conclusions, discussed in more detail below, include:

1. The employees' attitude toward the health care industry is somewhat negative.
2. The employees' understanding of the health care plan is lower than management expected.
3. The employees' quality perception of the health care plan is lower than management had hoped
4. The employees' quality perception of the overall plan is slightly higher than their perceptions of individual components of the plan.
5. The employees' attitude toward the company as a benefit provider is much more positive than their perception of the health care plan.

DISCUSSION

The academic literature on benefit satisfaction is sparse and inconclusive. To some extent this is attributable to the relatively low importance benefits have in determining overall satisfaction (Abbott, 2003a). The fact remains, however, that companies continue to strive to provide excellent benefits and spend an increasingly high percentage of their total compensation in the form of benefits, especially health insurance. Proactive companies, like the one that sponsored this study, will be wise to measure their employees' attitudes periodically to determine how satisfied they are with their health insurance and with the company as a provider of benefits.

In this case, there appears to be reasonable confidence in the employer as a benefit provider but a somewhat negative perspective toward both the health insurance industry in general and the health insurance plan the company provides. Future research should attend to the factors that predict these attitudes and investigate the fit between theoretical models of benefit satisfaction and this particular situation. Because the purpose of this paper is to describe the development of the survey and basic results, the question of more finely tuned relationships remains open. More specifically, subsequent work should focus on demographic factors predicting satisfaction, the relationship between understanding and quality perceptions, and the relationship between industry perceptions and attitudes toward the plan.

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ELECTRONIC INTENSIVE CARE: A TECHNICAL SOLUTION TO THE INTENSIVIST SHORTAGE

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ABSTRACT

The intensive care unit is one of the most complex of all medical systems. As medical care has improved, the type of patients treated in critical care units has changed from those with acute illnesses to those suffering from complications of chronic diseases. Because ICU patients are among the most ill in the hospital, adverse events are a constant danger and mortality rates are higher in ICU than in any other area of the hospital. As hospitals try a variety of solutions to improve patient care in the ICU, technology has the potential to improve efficiency and patient care. One highly technical solution, Electronic Intensive Care (eICU) involves the use of telehealth technology to provide remote monitoring of patients in the ICU unit

This paper study explores the recent development of eICU and the technology involved with eICU implementation. Through the use of semi-structured interviews, direct observation, field notes, and archival record analysis, a longitudinal, instrumental case study will be undertaken at a 755-bed tertiary-care, level-1 trauma center which will track the implementation of eICU and compare financial and patient outcomes resulting from the use of eICU, versus outcomes associated with traditional acute care.

INTRODUCTION

Information technology is positioned to change patient care in dramatic ways. Up to now the focus of IT spending has been transaction-based with an emphasis on improving payment efficiency, collecting data and creating medical health records. Attention has now shifted to improving patient safety, quality of care and on reducing medical error (McGee, 2003)

The Leap-Frog Group, a consortium of Fortune 500 companies and other large public and private health care sector purchasers, has identified three patient safety measures as the initial focus for improving safety and reducing medical errors (Meadows and Chaiken, 2002). These measures include medication errors, lack of evidence to support high-risk surgical procedures in some hospitals, and the lack of coordination of medical care for patients in intensive care units of hospitals (The Leapfrog Group Fact Sheet, n. d.). This study focuses on the third measure: lack of coordination of medical care for patients in intensive care units (ICU) hospitals. An ICU is a consolidated area of a hospital where patients with life-threatening illnesses or injuries receive around the clock specialized medical and nursing care. Intensive care is one of the hospital's most complex and expensive medical systems. As medical care has improved, the type of patients treated in critical care units has changed from those with acute illnesses to those suffering from

complications of chronic diseases. While better technology and better ways of taking care of patients has improved longevity and general health, the patients in the intensive care units of hospitals are getting sicker (Haugh, 2003). Mortality rates are higher in ICU than in any other area of the hospital due to the complexity of patients' medical condition.

To deal with this complexity a new category of physician has evolved—the intensivist. Intensivists are physicians highly trained in critical care medicine who focus exclusively on treating ICU Patients. The Leapfrog Group has called for full-time intensivist staffing as a way to save as many as 50,000 lives per year. However, less than 6000 intensivists are actively practicing in the US and only 13 percent of ICU patients receive dedicated intensivist care (VISICU fact sheet, n.d).

One solution to the shortage of intensivists is Electronic Intensive Care (eICU). EICU involves the use of telehealth technology to provide remote monitoring of patients in the ICU unit. The offsite eICU team, led by an intensivist, can monitor individual patients, analyze data and provide computer-assisted decision support to the on-site ICU staff. In current practice, the eICU enables one intensivist and one critical care nurse to track 50 patients. However, the creators of eICU believe that as many as 200 patients could be monitored by one eICU configuration.

This paper will proceed as follows: First, the hospital intensivist is further defined. Next the proprietary VISICU eICU software is described. Then the implementation of eICU at a hospital system is discussed and the results outlined. Finally the methodology and limitations of the proposed study are described.

HOSPITAL INTENSIVIST DEFINED

Hospitalists are physicians employed by hospitals who have chosen to forgo private practice, and work exclusively in the hospital setting, typically on 7-day, 12-hour-per-day shifts. They are generalists in that they serve as liaisons between the primary care provider in the medical office and the specialists in the hospital. Hospitalists attend to patients during their hospital stays instead of the primary care physician visiting the hospital. This arrangement allows primary care physician to spend more billable time with patients in their offices. Hospitalists provide a link to medical specialists and coordinate care so that all the physicians involved in a patient's plan of care know the most current diagnoses, orders and progress of the patient (Milstead, 2002).

The use of hospitalists is one way to coordinate care and reduce confusion throughout the hospital. While hospitalists have no medical specialty, intensivists are hospitalists who specialize in acute care. The Leapfrog Group (ICU Physician Staffing Fact Sheet, n.d.) defines intensivists as:

- (i) *Board-certified physicians who are additionally certified in the subspecialty of critical care medicine or*
- (ii) *Physicians board-certified in emergency medicine who have completed a critical care fellowship in an ACEP-accredited program or*
- (iii) *Physicians board-certified in Medicine, Anesthesiology, Pediatrics or Surgery who completed training prior to the availability of subspecialty certification in critical care and who have provided at least six weeks of full-time ICU care annually since 1987*

In the intensivist model, physicians highly trained in critical care medicine focus exclusively on treating ICU patients and link various therapists, specialists and other referring physicians to the primary care physician (Milstead, 2002). Less than 15 percent of American hospitals have full-time

intensivists. However a systematic literature review of ICU physician staffing and quality found that high intensity staffing (ICUs where intensivists manage or co-manage all patients) versus low intensity staffing (where intensivists manage or co-manage some or none of the patients) can result in a 30 percent reduction in hospital mortality and a 40 percent reduction in ICU mortality (Pronovost et al., 2002).

Clearly the use of intensivists improves patient outcomes. Unfortunately, within the healthcare community, there is a shortage of qualified intensivists. While only an estimated 5,500 to 10,000 intensivists are practicing today, it would take 30,000 to 40,000 intensivists to provide 24 hour coverage in ICUs across the nation (Greene, 2002).

THE VISICU EICU SOFTWARE

Two medical school faculty members at Johns Hopkins Hospital used their ICU experience to develop a system which leverages the scarcity of intensivists while using information technology to standardize the care process and enable ICU physicians to provide proactive care. Nationally known intensivists, Brian Rosenfeld, M.D., and Michael Breslow, M.D., had each been running ICUs for 15 years before they founded the privately financed Baltimore-based company called VISICU in 1998 (Becker, 2000).

Within the eICU care model an intensivist-led care team located apart from the hospital works with onsite ICU clinicians. The eICU facility does not house patients or replace the hospital ICU. Instead, the off-site team monitors individual patients, analyzes data and provides computer-assisted decision support to the on-site ICU staff (Beckley, 2003). EICU complements, but does not replace, on-site intensivist coverage (Greene, 2002), and is most effective as a supplement to an on-site intensivist who makes rounds, sets patient care plans and then returns to the office or operating room (Beckley, 2003).

The eICU links physicians and critical care nurses with multiple patients across a network of cameras, monitors, data and two-way communications links. Working remotely, the eICU team executes predefined plans or intervenes in emergencies when the patient's attending physician is not in the ICU. Command center computers can detect slight changes in a patient's condition, leading to more prompt effective treatment (Runy, 2002). The VISICU eICU proprietary technology improves physician workflow and enables clear communication between the ICU and eICU facility. "Cockpit-like sensors" enable the eICU team to monitor and reduce the time between problem identification and intervention. Software tools include (VISICU factsheet, n.d.):

- *Software alerts to avoid adverse events: VISICU's Smart Alerts software evaluates patient physiologic data for trends and thresholds. When the patient threshold levels vary outside of normal ranges, the eICU physician can intervene often avoiding an adverse event.*
- *On-line decision support: Using evidence-based care guidelines, clinicians have access to an interactive, on-line support tool called "The Source" which supports algorithm-driven interventions for diagnosis and treatment. Care recommendations are regularly updated using evidenced-based medicine, society guidelines and input from an international panel of experts.*
- *Outcomes tracking: The VISICU Smart Report system tracks clinical outcomes, resource utilization and operational efficiency. Patient queries can be customized for research purposes.*

- *Relational database for actionable patient knowledge: Using a dashboard-style user interface for clinical analysis of a patients' condition and a quick review of assigned tasks, the eCareManager software ensures organized on-site care and a seamless care transition between ICU and eICU care providers.*

Using these software tools, clinicians observing patients remotely work in a peaceful environment and are not distracted by the alarms and bustle of a hospital unit. According to Brian Rosenfeld (Greene, 2002), one of VISICI's founders, "It lets you focus on patient care". Becker (2002) describes how the eICU operates and how the eICU team can make virtual rounds: "Wearing a headset in front of a bank of computer monitors, ...communicates with patients and staff, ...analyzes n electronic stream of real-time clinical data and examines each patient through a high-resolution video screen clear enough to note the size of the patient's pupils."

The eICU concept was first tested at the 655-bed Johns Hopkins Bayview Medical Center during a four-month period. With 650 patients involved, mortality rates were reduced by 60 percent, complications by 40 percent and the cost of care by 30 percent (Becker, 2000). Currently ten hospital systems- are using eICU to remotely monitor multiple ICU's from one location. (Haugh, 2003).

THE SENTARRA IMPLEMENTATION

The first commercial application of eICU was installed in 2000 at Sentara Norfolk General Hospital System in Virginia (Becker, 2002) where the eICU provides round the clock monitoring of intensive care patients at three of Sentara's six hospitals. The eICU system was initially used at Sentara's smaller hospitals which physicians underutilized because they did not consider the ICU units to be comprehensive enough to meet potential acute care needs. However, with the success of the eICU model, these hospitals are now full. Sentara is next considering opportunities in outlying hospitals that are not part of the system but refer seriously ill patients. Rural hospitals could have three or four beds connected to the eICU system to enable the co-management of patients instead of moving them to Sentara for acute care

A study by Cap Gemini, Ernst & Young reported that mortality rates dropped by 25 percent in the first year of Sentara's use of the eICU concept, with the average ICU length of stay dropping by 17 percent. The resulting return on investment for is estimated to be 150 percent the first year of operation (Runy, 2002). Sentara saved \$2,150 per patient or \$3 million above program costs in the first year by reducing patient care expenses and increasing ICU capacity (Beckley, 2003, Haugh, 2003). Rodney Hockman CMO of Sentara suggests that the return may be even greater due to unintended benefits. These include improved staff satisfaction and employee retention, and decreased intensivists burnout.

THE PROPOSED STUDY

This paper provides the background for our proposed study. Our goal is to track the planning, development and implementation of an eICU installation at a 755-bed tertiary-care, level-1 trauma center. This hospital is the flagship installation for a medical system which includes six smaller hospitals in rural Eastern North Carolina. The rural hospitals in particular could benefit

from the remote monitoring in ways similar to those realized by Sentara. A longitudinal, instrumental case study is the planned methodology. Data gathering will utilize semi-structured interviews, direct observation, field notes, and archival record analysis. When the eICU system is implemented, it is our plan to compare financial and patient outcomes resulting from the use of eICU, versus outcomes associated with traditional acute care. At this time, the study is subject to limitations: The eICU system is still in the planning stage. A business plan has been written proposing the implementation of eICU pending budget approval. The study will be accomplished over a period of 2-3 years, depending on the speed and efficacy with which eICU is implemented across the specific healthcare enterprise.

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GOLDRATT'S THINKING PROCESS APPLIED TO BLOOD INVENTORY MANAGEMENT AT A REGIONAL MEDICAL CENTER

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ABSTRACT

The "Thinking Process" as introduced Dr. Eliyah Goldratt, in The Goal and further expounded upon in, It's Not Luck, is based on the Socratic teaching method of if ...then reasoning. This type of deductive reasoning is extensively used in the field of medicine, in the diagnosis and treatment of disease and for determining clinical pathways. Even though medical professionals find it easy to map out the cause and effect relationships when dealing with a disease process, few have explored the benefits of using their highly developed intuitive thinking skills in the business end of medicine. This paper will use elements of the Thinking Process, as outlined by Dr. Goldratt, in an attempt to elicit a single logical, comprehensive solution to a multifaceted, intricate problem: blood inventory management in a regional trauma medical center.

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