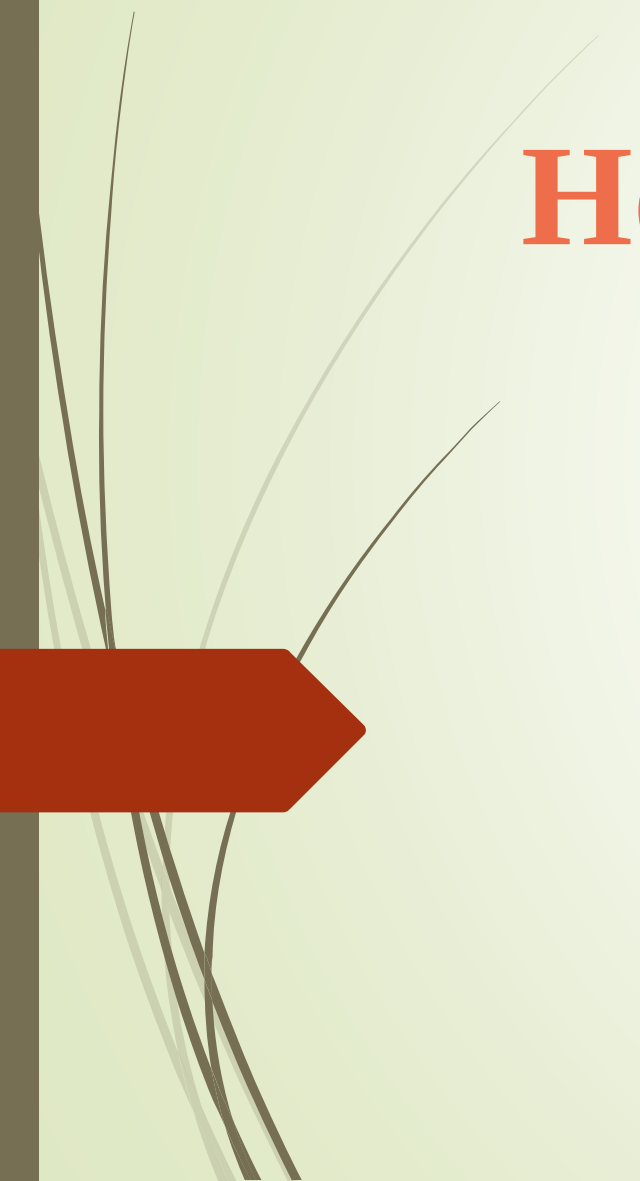




Hospital Bed Management Course

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September 2022



What is bed management?

Why we need a bed manager system?

Do you think is it important?



We will go on an exciting journey

today to found out... Be with me

and focus



We learn about...

- ➡ Hospital bed types
- ➡ Hospital bed ratio
- ➡ Hospital bed management systems and tools
- ➡ The challenge of the hospital bed management systems
implantation in Iran and around the world

ویژگی های تخت بیمار

- ▶ تخت های بیمارستانی باید دارای ریل ها و حفاظ های کنار تخت با قابلیت باز و بسته شدن باشند تا بتوانند از بیماران محافظت نماید.
- ▶ ارتفاع آن ها باید قابل تنظیم باشد.
- ▶ تخت های بیمارستانی در مقایسه با سایر تخت های معمولی از ابعاد بزرگتری برخوردار بوده که این امر می تواند در ایجاد حس رضایت بیمار تاثیر زیادی داشته باشد.
- ▶ علاوه بر آن تخت های بیمارستانی دارای قابلیت نصب سایر تجهیزات مورد نیاز می باشند.
- ▶ جنس بدنه تخت های بیمارستانی به گونه ای است که قابل شستشو و ضد عفونی نیز می باشند تا از انباشته شدن میکروب ها و انتقال بیماری از یک بیمار به بیمار دیگر جلوگیری نمایند.

ویژگی های تخت بیمار

➤ از جمله مشخصه های مهم تخت بیمارستانی، امنیت تخت بیمارستانی، تعداد شکن مورد نیاز در تخت بیمارستانی شکن دار

جهت راحتی استفاده بیماران، استقامت تخت بیمار برای تحمل وزنهای مختلف و همین طور کارایی تخت بیمارستانی برقی می باشد

➤ یک تخت بیمارستانی مرغوب دارای مشخصات زیر است:

سطح بستری آن در هر سه صورت یک، دو و یا سه شکن از جنس ABS با قابلیت شستشو و ضد عفونی می باشد. قسمت بالای تخت یا سرتختی تخت بیمار دارای تنوع رنگ، قابلیت نصب انواع بدساید، پوشش رنگ الکترواستاتیک، مجهز به ضربه گیر و پایه سرم، مجهز به دستگیره هایی در بالا و پایین، امکان نصب مانکی بار و وسایل ارتوپدی می باشد.

انواع تخت بیمارستانی

➤ تخت بیمارستانی مکانیکی

تخت بیمارستانی مکانیکی از ساده ترین نوع تخت های بیمارستانی هستند. برای تنظیم ارتفاع و سر و پای تخت می بایست به صورت دستی و بوسیله اهرم عمل کرد.

➤ تخت بیمارستانی الکترونیکی (فول) | تخت برقی

در این تخت ها تنظیم ارتفاع کلی تخت به همراه تنظیمات سر و پای تخت به صورت اتوماتیک انجام می گیرد

انواع تخت برقی

تخت های بیمارستانی برقی بر این اساس که زاویه تخت از چند قسمت تغییر می کند یا اصطلاحاً شکسته می شود به سه نوع تقسیم می شوند. حالت های ایجاد شده برای بیمار و راحتی بیمار با افزایش تعداد شکن ها افزایش می یابند.

➤ تخت بیمارستانی تک شکن

در این تخت ها فقط زاویه سر تغییر می کند.

➤ تخت بیمارستانی دو شکن

در این تخت ها قسمت سر و پای تخت تغییر زاویه می دهند.

➤ تخت بیمارستانی سه شکن

بهترین نوع تخت های بیمارستانی هستند و علاوه بر سر و پای تخت یک قسمت متحرک دیگر در مابین این دو قرار دارد.

ابعاد تخت بیمارستانی

➤ تخت بیمارستانی استاندارد باید دارای ابعاد بیرونی ۲۲۰ سانتی متر و عرض ۱۱۰ باشد. همچنین ابعاد داخلی آن ها شامل طول ۲۰۰ سانتی متر و عرض ۹۰ سانت خواهد بود .

➤ ابعاد تخت بیمارستانی در ایجاد حس امنیت و آرامش در بیماران موثر می باشد. زیرا بیمار در این تخت ها جای بیشتری برای گذراندن اوقات خود داشته و فضای بیشتری برای جا به جا شدن در تخت دارند.

ارتفاع تخت بیمارستانی

- منظور از ارتفاع در تخت های بیمارستانی فاصله بین کف تا سطح تخت های بیمارستانی می باشد. ارتفاع تخت های بیمارستانی در تخت های با پایه های ثابت ۷۵ سانت بوده و در تخت های بیمارستانی با قابلیت تنظیم ارتفاع از ۳۸ سانت تا ۱۰۰ سانت متغیر می باشد.
- تخت های با قابلیت تنظیم ارتفاع برای بیمارانی که نیاز به جا به جایی و پایین آمدن از تخت دارند مناسب تر می باشند.
- البته لازم به ذکر است که ارتفاع تخت ها مانند ابعادشان در تخت بیمارستانی سفارشی قابل تغییر می باشند.



تخت بیمارستانی تمام ABS



تخت بیمارستانی فول مدل ۲۰۲۰



تخت بیمارستانی ویلچر شو - تمام برقی



تخت بیمارستانی برقی صندلی شو مدل ۲۰۵۰



تخت ۲ شکن لگن خور



تخت بیمارستانی ABS مدل ۲۶۰۰



تخت بیمارستانی ABS مدل ۲۵۰۰



تخت بیمارستانی مدل ۲۸۰۰



تخت بیمارستانی پک شکن



تخت بیمارستانی مدل ۲۰۱۷



تخت بیمارستانی الکترونیکی ABS مدل ۲۵۰۰



تخت بیمارستانی مدل ۲۷۰۰



تخت بیمارستانی پک شکن



تخت بیمارستانی مدل ۲۰۱۷



تخت بیمارستانی الکترونیکی ABS مدل ۲۵۰۰



تخت بیمارستانی مدل ۲۷۰۰



What Are The Different Types of Hospital Beds?

There are 3 types of hospital beds: manual, semi-electric, and full-electric. Below, we give you a breakdown of each bed and our top-recommended product.

Manual Hospital Beds

[Manual hospital beds](#) are the least expensive models, with fewer features than semi-electric or full-electric options. A manual hospital bed requires a caregiver to make adjustments via a hand crank, making this type of bed most appropriate in situations where it won't be necessary to make frequent adjustments.

Pros

- Least expensive type
- Good choice if frequent adjustments aren't necessary

Cons

- Potential caregiver strain from making manual adjustments
- Not as many position choices as electric beds



Adjustable Manual Hospital Bed by Drive Medical

Features an adjustable head, foot, and overall bed height

FREE SHIPPING!

View More: [Manual Hospital Beds](#)

This adjustable bed facilitates transfers and offers unobstructed caregiver access for enriched patient comfort, treatment, and care.

- Manual adjustment style requires no electricity or power source
- 350-lbs weight capacity lends comfortable support to patients
- Adjustable head and foot sections allow for ideal patient positioning
- Height adjustable frame enables easier access for care/treatment
- Offered in a variety of packages to perfectly suit your unique needs

List Price: \$1,034.00

Starts At: **\$830.24** (Save 20%)



Activate Windows
Go to PC settings to activate Windows.

Semi-Electric Hospital Beds

A [semi-electric hospital bed](#) is a good choice for someone who has good enough balance that it is not necessary to adjust the height of the bed to transfer on and off. This style of bed uses electric and manual adjustments, with the head and foot sections usually adjusted electrically while the height is adjusted with a manual crank.

Pros

- Easy to make head and foot positioning adjustments
- Lower cost for the feature of head and foot adjustability than a full-electric home hospital bed
- User confidence and independence is supported with user-adjustability

Cons

- Must rely on a caregiver to make height adjustments
- Using a hand crank puts a strain on caregivers

Best Semi Electric Hospital Bed: Competitor II Semi-Electric Hospital Bed by Drive Medical



Competitor II Semi-Electric Hospital Bed by Drive Medical

450 pounds capacity

★★★★★ 5 of 5 stars ([Read Customer Reviews](#))

FREE SHIPPING!

On-Site Assembly Available

[View More: Semi Electric Hospital Beds](#)

Built for both personal or commercial use, this adjustable hospital bed offers dual upper and lower body mobility from the touch of a remote control!

- Quiet UL-approved motor for adjustments that won't disturb patient rest
- Manually height adjustable to suit a variety of patients and needs
- LED Glow-in-the-dark remote for easy use at any light level
- Remote battery backup to prevent bed from losing power during outages
- Includes full rails for patient safety and easy maneuverability

List Price: \$1,064.05

Starts At: **\$800.04** (Save 25%)

Activate Windows

Full Electric Hospital Beds

The height, head, and feet adjustments are made with the push of a button on a [full-electric hospital bed](#). If a patient is able to control the bed positioning, it decreases reliance on caregiver assistance and increases independence and confidence. If a caregiver isn't close by, most full-electric beds have a feature that locks the bed in position so a patient can't accidentally move it into a position that could be dangerous.

Pros

- No strain on caregivers to adjust the bed
- When allowed, user can adjust the bed without assistance
- Addresses multiple conditions and positioning needs (sleep, circulation, skin issues, aches and pains)

Cons:

- Highest price point

Best Full Electric Hospital Bed: [UltraCare XT Four Section Joerns Hospital Bed Frame with Trendelenburg](#)



Shown with Spiced Cherry Panel Finish

UltraCare XT Four Section Joerns Hospital Bed Frame with Trendelenburg

Choose Frame Length

FREE SHIPPING! (Dock to Dock)

On-Site Assembly Available

View More: [Full Electric Hospital Beds](#)

This electric adjustable bed is built with four sections for optimal positioning, elevating patients' overall comfort. It features adjustable back and knee support, and height.

- Made with a stronger steel frame
- Choice of bedframe length and width
- Built with enhanced functionality and versatility
- Equipped with AdvanceCare positioning controls
- Structured in four sections for ultimate positioning

List Price: \$3,386.00

Starts At: **\$2,546.38** (Save 25%)

How to Choose a Hospital Bed for Home Use

- Sleep, or the lack of it, impacts the brain and body on a molecular level. It impacts energy balance, intellectual function, alertness, and mood. Sound sleep is a necessity in order to function at your best and most healthy.
- People who use a hospital bed at home often deal with medications, illness, and pain - all of which can get in the way of quality sleep. Choosing the right bed can facilitate restorative sleep that contributes to your overall good health.

Hospital beds ratio

- Data type: Ratio
- Topic: Health systems resources
- Definition: The number of hospital beds available per every 1,000 inhabitants in a population, at a given year, for a given country, territory, or geographic area.
- Method of measurement : Data are provided by WHO/PAHO country offices and technical regional programs based on information reported by the national health authority.
- Unit of Measure: Persons per 10 000 population

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سامانه پست الکترونیک دانشگاه علوم

hospital beds world health orga

GHO | By category | Hospital be

Hospital beds (per 10 000 popul

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https://apps.who.int/gho/data/view.main.HS07v

☆🔍Search

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World Health Organization

🏠

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Global Health Observatory data repository

Data analysis

By theme

By category

By indicator

Metadata

About the Observatory

Search

By category > Health systems > Health service delivery

Hospital bed density

Data by country

filter table | reset table

Last updated: 2020-07-01

Download filtered data as: CSV table | XML (simple) | JSON (simple)

Download complete data set as: CSV table | Excel | CSV list | more...

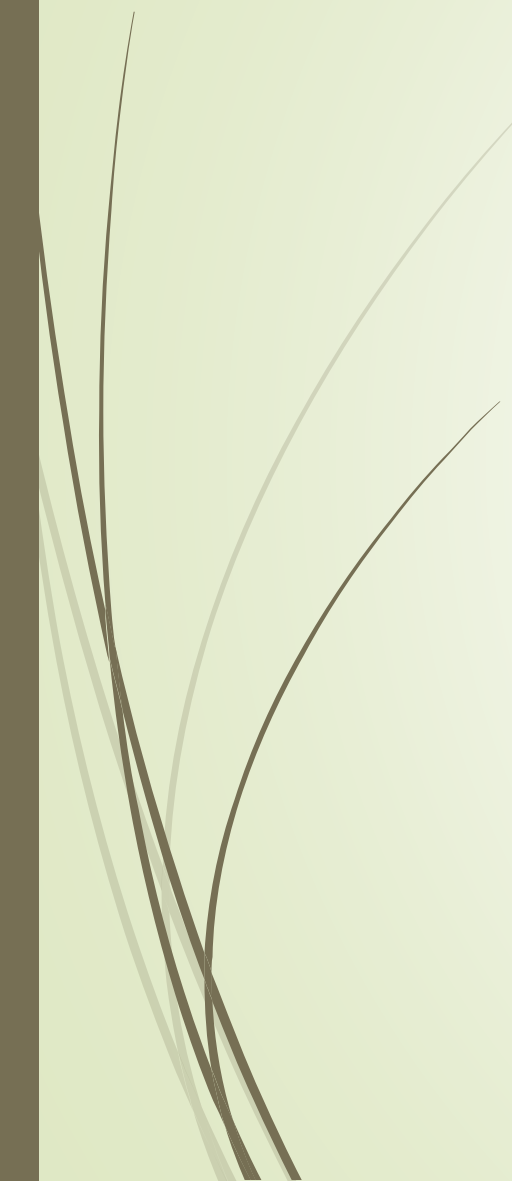
Country	Year	Hospital beds (per 10 000 population) ⁱ
	2007	73.3 ⁱ
	2006	74.5 ⁱ
	2005	75.7 ⁱ
	2004	76.5 ⁱ
	2003	77.3 ⁱ
	2002	77.6 ⁱ
	2001	77.7 ⁱ

Activate Windows

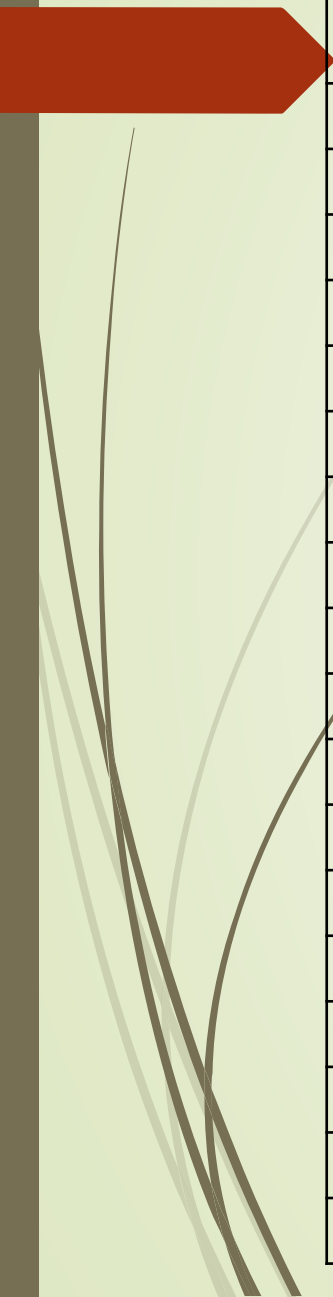
Go to PC settings to activate Windows.




v	Country (string)	Hospital beds (per 10 000 population) (string)
2000	Pakistan	6.7
2001	Pakistan	6.6
2002	Pakistan	6.9
2003	Pakistan	6.8
2004	Pakistan	6.8
2005	Pakistan	7.0
2006	Pakistan	12.5
2007	Pakistan	10.0
2008	Pakistan	6.0
2009	Pakistan	6.0
2010	Pakistan	6.0
2011	Pakistan	6.0
2012	Pakistan	6.0
2013	Pakistan	6.0
2015	Pakistan	6.0
2014	Pakistan	6.0
2016	Pakistan	6.3
2017	Pakistan	6.3



v	Country (string)	Hospital beds (per 10 000 population) (string)
2000	Germany	91.2
2001	Germany	90.1
2002	Germany	88.7
2003	Germany	87.4
2004	Germany	85.8
2005	Germany	84.7
2006	Germany	83.0
2007	Germany	82.4
2008	Germany	82.1
2009	Germany	82.4
2010	Germany	82.5
2011	Germany	83.8
2012	Germany	83.4
2013	Germany	82.8
2015	Germany	81.3
2014	Germany	82.3
2016	Germany	80.6
2017	Germany	80.0



v	Country (string)	Hospital beds (per 10 000 population) (string)
2000	Iran (Islamic Republic of)	15.9
2001	Iran (Islamic Republic of)	15.9
2002	Iran (Islamic Republic of)	16.3
2003	Iran (Islamic Republic of)	16.3
2004	Iran (Islamic Republic of)	16.3
2005	Iran (Islamic Republic of)	17.2
2006	Iran (Islamic Republic of)	17.2
2007	Iran (Islamic Republic of)	17.2
2008	Iran (Islamic Republic of)	13.8
2009	Iran (Islamic Republic of)	13.8
2010	Iran (Islamic Republic of)	17.4
2011	Iran (Islamic Republic of)	17.4
2012	Iran (Islamic Republic of)	15.0
2013	Iran (Islamic Republic of)	15.0
2015	Iran (Islamic Republic of)	15.0
2014	Iran (Islamic Republic of)	15.0
2016	Iran (Islamic Republic of)	17.0
2017	Iran (Islamic Republic of)	15.6

WHO Regional Publications, Western Pacific Series No. 4

DISTRICT HOSPITALS: GUIDELINES FOR DEVELOPMENT

Second Edition



District hospital

- District hospitals have a great responsibility, not only for providing care at the first referral level but also for supporting primary health care activities at the health center level. The importance of improving the performance of district hospitals needs no emphasis.
- Adequate planning, design, management and maintenance of the facilities and equipment of the district hospitals are essential to ensure the high quality of hospital services at a reasonable cost.

3.4 Physical scale

The size of a district hospital is a function of the hospital bed requirement, which in turn is a function of the size of the population served.

The groupings of populations around health facilities vary. A survey of the Member States of the Western Pacific Region revealed that primary health care facilities generally serve communities of 5000—10 000 people, and first-level referral hospitals generally serve communities to 50 000—500 000. In some countries, an intermediate level of primary health care facility exists, serving populations of 10 000—50 000.

The physical scale of the hospital is established on the basis of a determination of the number of beds required and a suggestion for the minimal hospital area per bed. One method that can be used to determine the number of beds is based on the expected patient load, as shown in the following example:

Data collected:

Population of district	150 000
Average length of stay in hospital	5 days
Annual rate of admissions	1 per 20 population

Computations:

- (1) Total number of admissions per year:
= district population X rate of admission per year
= 150 000 X 1/20 = 7500
- (2) Bed-days per year:
= total number of admissions per year x average length of stay in hospital
= 7500 X 5 = 37 500

(3) Total number of beds required when occupancy is 100%:

= bed-days per year $\div$ 365 days

= 37 500 $\div$ 365 = 102.74

(4) Total number of beds required when occupancy is 80%:

= bed-days per year $\div$ (365 X 80%)

= 128.42, say 130 beds

Using this approach, the number of “justified” admissions must be estimated on the basis of the existing level of admissions, corrected according to a population survey to determine the number of people who needed hospitalization but could not be admitted and to a hospital audit that showed how many patients had been hospitalized.

The “appropriate” average length of stay can be estimated from the prevailing one, corrected for both delayed and premature discharges when this information is available in hospital records.

The “acceptable” rate of occupancy is established by approximation. It should be high, but not so high that incoming patients must be rejected or placed two in one bed space. Special, separate consideration should be given, however, to the needs of chronic (long-term) patients and to referrals for tertiary care.

In many cases, hospital bed requirements should not be based on “international” or even national standards. Rather, an attempt should be made to approximate bed needs by district or region, taking into consideration:

- the prevalence of morbidity that must be treated in a hospital, on the basis of severity and frequency, which will differ in rural, urban, peri-urban, agricultural and industrial environments;
- the ability of the health services outside the hospital to reduce the need for beds;
- the age structure and concentration of the population;
- communications and transport facilities;
- other socio-economic determinants, such as the capacity of the local area to support hospital services, including the availability and distribution of human resources and the capacity of available utilities (e.g., water and electricity supplies).

The decision to build a new district hospital to augment existing facilities depends on how adequate the existing facilities are to meet the health needs of the population.

MONITORING THE BUILDING BLOCKS OF HEALTH SYSTEMS:

A HANDBOOK OF INDICATORS AND
THEIR MEASUREMENT STRATEGIES



Table: List of recommended core indicators

Building blocks and indicators	Data collection methods / Data sources
1. Health Service Delivery	
• Number and distribution of health facilities per 10 000 population • Number and distribution of inpatient beds per 10 000 population	District and national databases of health facilities. Special efforts — notably facility censuses — are often required to obtain the number of private facilities, especially if no registration system is enforced.
• Number of outpatient department visits per 10 000 population per year	Routine health facility reporting system Population-based surveys
• General service readiness score for health facilities • Proportion of health facilities offering specific services • Number and distribution of health facilities offering specific services per 10 000 population • Specific-services readiness score for health facilities	Health facility assessments

Table 1.2 Summary of proposed core indicators to monitor service delivery

Core Indicators	Data collection method
General service availability	
1a Number and distribution of health facilities per 10 000 population	National database of health facilities (often requiring facility censuses)
1b Number and distribution of inpatient beds per 10 000 population	
1c Number of outpatient department visits per 10 000 population per year	Routine health facility reporting system Population-based surveys
General service readiness	
2a General service readiness score for health facilities	Health facility assessments
Service-specific availability	
3a Proportion of health facilities offering specific services	Health facility assessments
3b Number and distribution of health facilities offering specific services per 10 000 population	
Service-specific readiness	

- 
- 
- General service availability refers to the physical presence of delivery of services that meet a minimum standard.
 - Availability comprises health infrastructure (facilities and beds per 10 000 population), the health workforce per 10 000 population and aspects of service utilization (inpatient/outpatient visits per 10000 population).



➤ Definition

The number of inpatient beds available relative to the total population for the same geographical area.

- • Numerator: the number of inpatient beds. This includes total hospital beds (for long-term and acute care), maternity beds and pediatric beds, but not delivery beds. Public and private sectors are included.
- • Denominator: the total population for the same geographical area.



Hospital beds by function of care (HP.1)

Definitions

Updated: July 2021

Hospital beds by function of care

Total hospital beds

Total hospital beds (HP.1) are all hospital beds which are regularly maintained and staffed and immediately available for the care of admitted patients. They are the sum of the following four categories: i) **Curative (acute) care beds**; ii) **Rehabilitative care beds**; iii) **Long-term care beds**; and iv) **Other hospital beds**.

Inclusion

- Beds in all hospitals, including general hospitals (HP.1.1), mental health hospitals (HP.1.2), and other specialised hospitals (HP.1.3)
- Occupied and unoccupied beds

Exclusion

- Surgical tables, recovery trolleys, emergency stretchers, beds for same-day care, cots for healthy infants
- Beds in wards which were closed for any reason
- Provisional and temporary beds
- Beds in residential long-term care facilities (HP.2).

Note: Average number of available beds over the year where possible.

Curative (acute) care beds

Curative care (acute care) beds in hospitals (HP.1) are hospital beds that are available for curative care (HC.1 in the SHA classification).

Inclusion

- Beds accommodating patients where the principal clinical intent is to do one or more of the following: manage labour (obstetrics), cure illness or provide definitive treatment of injury, perform surgery, relieve symptoms of illness or injury (excluding palliative care), reduce severity of illness or injury, protect against exacerbation and/or complication of illness and/or injury which could threaten life or normal functions, perform diagnostic or therapeutic procedures
- Beds for psychiatric and non-psychiatric curative (acute) care
- Beds in all hospitals, including general hospitals (HP.1.1), mental health hospitals (HP.1.2) and other specialised hospitals (HP.1.3)

Exclusion

- Beds allocated for other functions of care (such as rehabilitation, long-term care and palliative care).

Note: Average number of available beds over the year where possible.

Rehabilitative care beds

Rehabilitative care beds in hospitals (HP.1) are hospital beds that are available for rehabilitative care (HC.2 in the SHA classification).

Inclusion

- Beds accommodating patients for services with the principle intent to stabilise, improve or restore impaired body functions and structures, compensate for the absence or loss of body functions and structures, improve activities and participation and prevent impairments, medical complications and risks
- Beds for psychiatric and non-psychiatric rehabilitative care
- Beds in all hospitals, including general hospitals (HP.1.1), mental health hospitals (HP.1.2) and other specialised hospitals (HP.1.3)

Exclusion

- Beds allocated for other functions of care (such as curative care, long-term care and palliative care).

Note: Average number of available beds over the year where possible.

Long-term care beds

Long-term care beds in hospitals (HP.1) are hospital beds accommodating patients requiring long-term care (HC.3 in the SHA classification).

Inclusion

- Beds in long-term care departments of general hospitals (HP.1.1), mental health hospitals (HP.1.2) and other specialised hospitals (HP.1.3)
- Beds for psychiatric and non-psychiatric long-term care
- Beds for palliative care

Exclusion

- Beds for curative care (HC.1)
- Beds for rehabilitation (HC.2).

Note: Average number of available beds over the year where possible.

Other hospital beds

All **other beds in hospitals (HP.1)** not elsewhere classified.

Inclusion

- Beds for other health care services not elsewhere classified.

Note: Average number of available beds over the year where possible.

رئیس / سرپرست محترم دانشگاه / دانشکده علوم پزشکی و خدمات بهداشتی درمانی ...

با سلام و احترام

همانگونه که مستحضرید یکی از چالشهای اساسی ارائه خدمات کیفی به بیماران در بخشهای اورژانس بیمارستانی، طولانی شدن مدت زمان اقامت بیماران در بخش اورژانس است و این امر خود ناشی از عدم تعیین تکلیف به موقع بیماران است. از این رو بدنبال ابلاغیه برنامه جامع اصلاح فرایندهای اورژانس های بیمارستانی، برای ساماندهی وضعیت موجود و اولویت بندی بستری از بخش اورژانس بیمارستانی؛ پس از بحث و بررسی جامع در "کمیته راهبردی ارتقای بخشهای اورژانس بیمارستانی" موارد به شرح زیر جهت اجرا ابلاغ می گردد:

۱- ریاست بیمارستان باید روند بستری بیماران در بخشهای اورژانس را بطور روزانه بررسی نماید.

۲- در هر بیمارستان کمیته ای به نام "تعیین تکلیف بیماران" تشکیل می گردد. این کمیته موظف است پروتکل های مربوط به تعیین تکلیف بیماران بخش اورژانس و سایر بخش های بیمارستان را تدوین و بر حسن اجرای آن نظارت نماید. بدیهی است این پروتکلها در بیمارستانهای آموزشی و غیر آموزشی تفاوت خواهد داشت. اعضای کمیته مزبور شامل رئیس بیمارستان، مترون، روسای بخشهای بستری، مسئول فنی بخش اورژانس، مسئول پرستاری بخش اورژانس، متخصص طب اورژانس، سوپروایزرهای بیمارستان می باشند.

۳- در هر بیمارستان جایگاهی تحت عنوان bed manager (مدیریت تختهای بستری) تعریف و با ابلاغ مستقیم ریاست بیمارستان معرفی گردد و این مدیر مسئولیت نظارت مستقیم بر جریان بستری بیماران ورود به بخش اورژانس تا بستری و ترخیص از بخشهای بستری را داشته و ضمن پوشش کافی موانع دقیق بستری بیمار را بررسی و برطرف و در کمیته تعیین و تکلیف بیمارستان جهت تبیین روش مناسب مطرح می نماید.

۴- در بیمارستان های دارای متخصص طب اورژانس، تعیین تکلیف بیماران و تصمیم گیری در مورد گروه تخصصی مسئول و بخش بستری بیمار بر عهده متخصص مقیم طب اورژانس در آن شیفت است و در بیمارستان های فاقد متخصص طب اورژانس، یک نفر متخصص جراحی یا متخصص داخلی مقیم عهده دار این نظارت است.

۵- کلیه متخصصان (هیئت علمی و کادر درمانی) چه در روزهای عادی و چه در زمان آنکالی موظفند بیماران بخش اورژانس را ویزیت و تعیین تکلیف نمایند. مسئولیت رسیدگی به این موضوع بر عهده ریاست بیمارستان و کمیته تعیین تکلیف نمایند.

۶- تا زمانی که بیماران نیازمند بستری در یکی از بخشهای بیمارستان در اورژانس حضور دارند، پذیرش و بستری بیماران غیر اورژانسی (الکتیو) انجام نمی پذیرد و نظارت بر اجرای این امر بر عهده ریاست بیمارستان و bedmanager می باشد.

۷- در مواردی که ازدحام و انبوه بیماران در بخش اورژانس مانع ارائه مراقبت بموقع و مناسب به بیماران می گردد و تخت خالی جهت بستری بیمار در بخش مربوطه وجود ندارد، با نظر bed manager در بخشهای غیر مرتبط ولی ترجیحا در رشته نزدیک بستری می شوند.

لازم است ضمن ابلاغ به بیمارستان های تحت پوشش، پیشرفت کار در هیئت رئیسه دانشگاه بطور دوره ای مورد ارزیابی قرار گرفته و هر دوماه به اینجانب منعکس گردد.



What is bed management

Though Bed Management is a core operational activity in all hospitals, many hospitals have problems with it. This seemingly simple activity is anything but that. Few institutions have complete visibility of this process as it weaves its way through the organization and fewer still have a means of measuring the performance of the activity that results in the availability of a bed. Optimizing Bed Management is critical to the efficient functioning of any hospital.

Bed Management is a background activity in hospitals that few consciously notice - at least not until something goes wrong. Inefficient, or worse, ineffective Bed Management is the bane of hospitals all over the country, bringing in its wake myriads of problems for patients, nurses, physicians, and administrators.

In many hospitals, Emergency Rooms (ER) and admission offices are often overcrowded with patients waiting for rooms. This forces physicians to move patients around or to start using competing local hospitals. Sometimes, patients must be accommodated in halls. At other times, poor Bed Management puts valuable ER rooms out of use, leading to treatment limitations for critically ill patients.

In all these scenarios, patient and physician dissatisfaction is the immediate result, not to speak of a long term decrease in admissions. At times, the very safety of patients is at risk. While the exact problems and their results can vary, the fact remains that these problems are avoidable.

Although automated support can help in efficient Bed Management, the key to any real improvement lies with workflow complexity and operational performance. While staff performance plays a big role, it is process design and management - or the lack of it - that needs to be tackled on a priority basis.

Bed Management is an operation in
constant evolution which is usually not
controlled at the process level. Typically,
managers are faced with performance
issues that are inwardly focused within
their groups. But given the complexities of
hospital operations today, all operational
areas are interrelated. Thus, any significant
improvement requires a fresh perspective
- a crossfunctional or process view. In
this view, the entire function of Bed
Management is open for review and
management and changes, if any, must be

incorporated into the work and workflow
of the department.

This requires a two-level approach
to Operational Management and
Optimization:

- Process-level Management and Optimization
- Followed by Operational Workflow Management and Optimization within the department



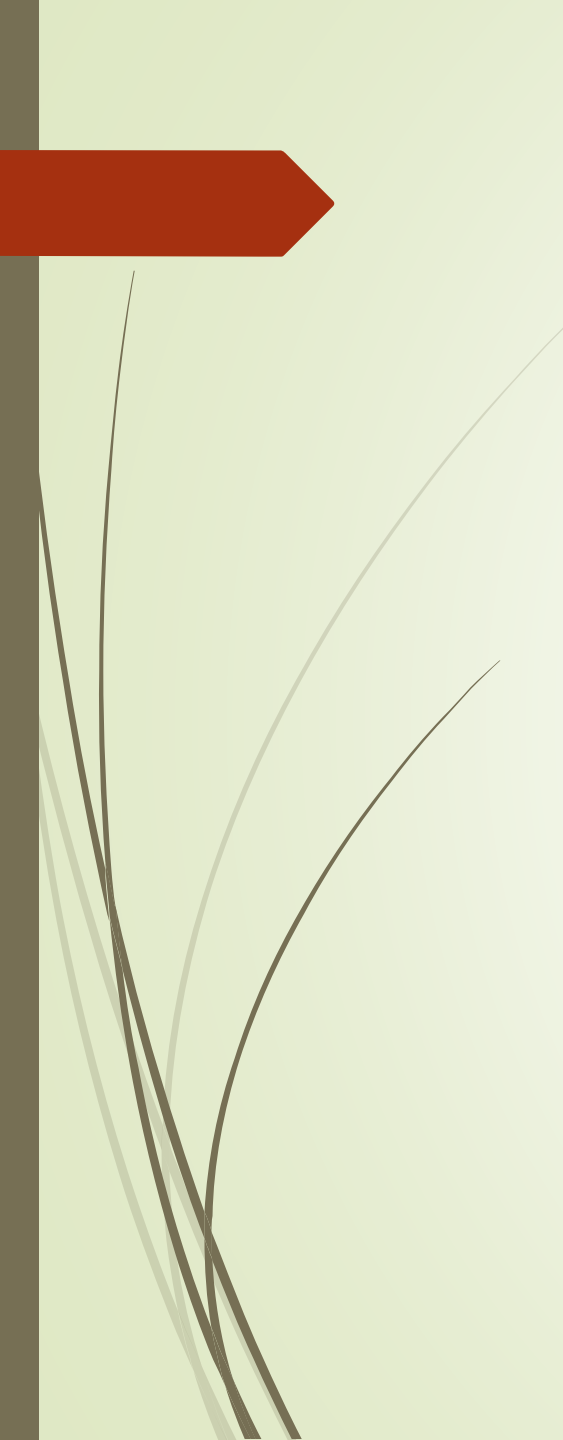
Unfortunately, few organizations have this level of operational visibility or control. We have found that for most organizations, 'process' maps are at the internal organization level and really reflect workflow, not process (which is cross-organizational). We have also found that few organizations pay much attention to their operational maps once they are created and fewer still keep them up-to-date or use them to guide improvement. Without this process-level view, work can only be improved at the local workflow level and the overall process cannot be improved or optimized. For efficient Bed Management, the two-level approach is absolutely critical. It is important that the entire process is optimized as a first step. Then, the parts of the process that lie within each organization should be operationally optimized.

A process-level view of Bed Management provides insights into all the activities of different groups - from Admission/Discharge/Transfer (ADT) to House-Keeping to ER and so on - and how these activities flow. Maps of these activities comprise work steps from all organizations even remotely involved in the process. As such, it is important that any map be cross-referenced at the step level with the organization that performs the step. As the flow of information and activity is mapped, the steps take on a context that shows decisions, rules and relationships. In any process, application systems have

a significant impact on productivity and downstream work. But in most hospitals, the systems support only part of the Bed Management process. This causes process disconnects as the work and the systems that support the work are often poorly tied. While this is often a workflow problem rather than a systems problem, it can be both. These disconnects happen because of hidden manual and automated components that often fail to work in close sync to offer a smooth working process. By providing application support at the points it is used ('touch points'), the management can easily view the impact - or lack of it - at all steps and at an overall level. This association of step, work, and support can be augmented with data needs, use, flow, and transform information to provide a firm understanding of the operation.

Known patient volume information and problems can now be added to the process maps to complete the picture of the operation. Once the hospital enters this information into a Business Process Management (BPM) tool, it will be in a position to:

- Modify the process
- Define process management activity
- Generate process management applications
- Begin to control the process's evolution



The process can then be analyzed and operational 'break points' defined. Break points are places in the process where the activity breaks down or where the clinical quality is affected. By determining the factors that cause these problems, the management will be able to describe them in terms of characteristics. These characteristics can then be viewed as a grouping of factors that can be associated with one or more work steps and measured. This is the driver for real-time dashboard support for the process.

Dashboards Show Real-time Activity

Once the process is understood and the break points identified and defined in a way that lets management measure operational flow, a comprehensive dashboard that shows real-time activity must be put in place. This dashboard should measure activities in all departments involved in the Bed Management process and show workload or delays, etc. Alerts should be included as the backlog or time approaches set limits, with drill down information on what is causing the alert. Management can then take pre-emptive action based on such information. Over a given time, management is also able to define trends and operating scenarios that set the stage

for problems.

The challenge of setting up the dashboard has nothing to do with technology. There are several good dashboard products that can do the job. Interfacing is a challenge,

but that can be handled with brute workforce. The real issue that can make or break the operational management and improvement effort is an understanding of what to measure. This is an area that is most often not given the attention it deserves.

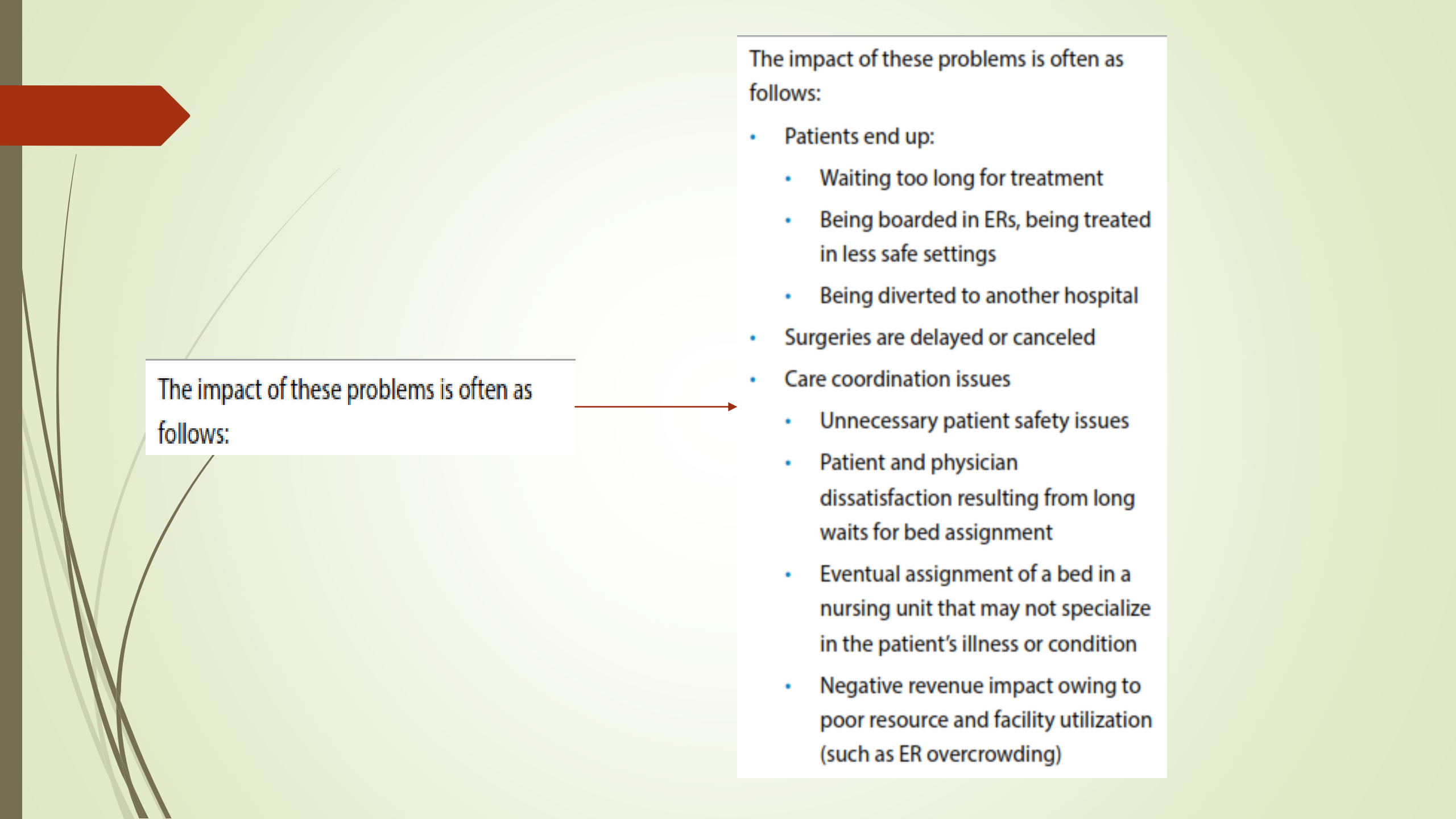
Hospitals don't need to overburden managers or staff with meaningless monitoring or performance measurements because the key to performance management is the control of activity

at the break points. These are the points where things come together or delays occur. They are not necessarily points where the problem actually occurs. Those are defined in the characteristics that describe what can go wrong to cause a problem at the break point. While the dashboard should provide detailed drill down information for management to take corrective action, the monitoring must be at key activity completion points.

The dashboards can thus track breakpoint information against defined criteria with limit and aging logic, and provide alerts. Using a drill down for alerts, the dashboard shows the exact cause of the problem.

through this approach, all measurement and change must be managed through the process maps imbedded in the BPM tools. These process maps are as useful as the institution's commitment to their use allows. If the organization views these models and information as a one-time project, they are not kept up-to-date and simply become 'shelf art'. However, if the organization is committed to moving to a process-based approach to Bed Management, the models and information become the starting point for all change and process management optimization. Some of the problems in a Bed Management process include

- Inter- and intra-department communications
- Disagreements on problem causes and ownership of problem correction
- Department turf issues
- Policy issues
- A lack of integration between systems that increase manual work in bed scheduling and bed preparation



The impact of these problems is often as follows:

The impact of these problems is often as follows:

- Patients end up:
 - Waiting too long for treatment
 - Being boarded in ERs, being treated in less safe settings
 - Being diverted to another hospital
- Surgeries are delayed or canceled
- Care coordination issues
 - Unnecessary patient safety issues
 - Patient and physician dissatisfaction resulting from long waits for bed assignment
 - Eventual assignment of a bed in a nursing unit that may not specialize in the patient's illness or condition
 - Negative revenue impact owing to poor resource and facility utilization (such as ER overcrowding)



In moving forward to improve Bed Management, a variety of challenges must be overcome. While these vary from hospital to hospital, the list of challenges likely includes:

- Balancing demands from the different patient entry or transfer points such as ER, OR, and admitting physicians

- Operational coordination among the various groups as a result of poor communication among the various stakeholders

- Poor visibility of the Bed Management process

- Bed Management tracking - status in each part of the Bed

Management process

- Up-to-date information - bed availability not shown/ updated in the system

- Delays in patient discharge

- Delayed bed cleaning - uncoordinated housekeeping activity



The factors that make Bed Management complicated are:

- **A lack of end-to-end process visibility and management:** Activities in the different departments that contribute to the overall Bed Management function are segmented with no one overall process manager
- **Application interoperability:** Data handoff and sharing are usually inadequate to support operational scenarios - that span departments - in an efficient and timely manner
- **Inflexible specialization:** Specialty nurses are geared toward specific patient populations. This results in a high degree of customization and leads to lack of flexibility in bed assignment when units reach their maximum capacity
- **Bed assignment mismatch:** Assignment to a bed in a nursing unit that specializes in treatment unrelated to the patient's condition. This happens because of bed shortages and leads to potential patient problems in terms of quality of care, clinical outcomes, and increased length of stay

- **Delays:** Patients often wait for hours to be admitted and assigned a bed. This puts a strain on the ER, resulting in inefficient use of ER resources
- **Poorly supported patient care strategies:** Units are organized to provide progressive care, and a change in the patient's condition is marked by movement from one bed to another. E.g. The obstetrics division contains labor rooms, delivery rooms, postpartum beds, maternity beds, and nurseries for newborns. It is often seen that a bottleneck to patient flow occurs due to lack of advance planning and visibility into anticipated patient movements - a 'blocked transfer' situation which prevents the patient from getting the right medical attention (bed) at the right time. Bed assignment thus becomes an ad hoc activity

Some things to consider when improving the Bed Management process:

- Ability to identify capacity statistics and patient information such as admissions, discharges, room information, and basic patient demographics through the ADT interface capability
- Capacity to support multiple users logged in concurrently at multiple sites
- User-friendly interface
- Real-time notification to bed cleaning/ housekeeping services regarding bed status
- Multi-level performance tracking report package
- View of house capacity in one-screen/ scroll view
- Ability to view and track:
 - Current bed status
 - Pending admissions
 - Transfer requests
 - Off-service placement

• Provide a real-time view into key operational performance variables such as:

- Cycle times from door to discharge
- Key throughput milestones by acuity level such as: door to disposition, triage to disposition, and triage to MD assessment
- Diagnostic turnarounds
- Time from inpatient orders to bed placement by unit and acuity
- Number of ER boarders, patients leaving without being seen (LWBS), and patients leaving against medical advice (AMA)

operation needs to include:

- Resolution of problems
- Opening access to the right information
- Technical interfaces between applications
- Construction of needed data marts to open access to data
- Process-oriented performance measurement with feedback to support continuous improvement
- Advanced operational reporting using a dashboard to summarize information and provide alerts

• The new solution design for the

Optimizing Bed Management

Optimization of any activity must begin with a definition of optimization as it applies to the context of that operation. As such, any definition has a narrative description of the concept and a set of characteristics that can be used to identify what optimization or any term looks like in the context of the operation. These characteristics eventually form the foundation for measuring an optimal state and are of critical importance. Optimal Bed Management can be defined through a set of characteristics. These include:

- Formal, articulated, hospital Bed Management goals that tie to patient safety and satisfaction, and financial management
- A formal Bed Management process that is visible to all involved and where everyone knows his or her role and how the process functions

- Formal Bed Management standards that tie to activity completion points in the process

- Formal Key Performance Indicators (KPIs) that align to key points in the Bed Management process where errors are common, work delays happen, or hand-offs occur

- Formal KPIs that tie back to patient safety indicators and patient satisfaction surveys

- All application systems involved communicate in real time

- Bed Management procedures (automated and manual) that predict availability, coordinate room/ bed sanitation, and that release the bed for use in a timely manner as defined by formal hospital standards

- Point of notification data entry that

starts the bed assignment process - from registration, ER, paramedic calls, ambulance calls, etc Application systems that deliver all relevant patient information from all hospital applications to the point of entry (Registration, E/R or associated clinic, etc)

- Placement of the patient in the right nursing unit based on condition and physician (adherence with hospital guidelines in patient-bed placement)

- Proper workload balancing and management in all Bed Management support services - cleaning crew, transport, nursing unit notification, etc. - tracked and evaluated based on hospital standards

Optimization must occur at two levels in the operation. The first of these levels is the process level which is a crossfunctional or cross-organizational survey of everything that is part of the Bed Management process. The second is within each of the business and clinical units that perform parts of the Bed Management process. Both these levels must be considered because it is quite possible to optimize at the process level and cause serious workflow problems in the business and clinical units. Optimization is thus a balancing between both levels. For this reason, optimization requires an iterative approach to redesign. Using BPM tools, iterations can be created and tested quickly. But even without the help of these tools, ideas must be tried and creativity

promoted to get the best possible solution. Optimization also takes on different meanings based on the perspective of the person defining it for the operation. An example is the difference between the financial perspective and the quality perspective. For this reason, the definition and components of an optimized

perspective. For this reason, the **definition** and components of an optimized operation need to be formally agreed upon by everyone involved in determining when an operation is optimal. This definition and the component parts that describe it are the foundation for performance measurement. Without this, formalization opinions differ and results of performance measurement are open to interpretation. Once identified and defined, it is necessary to determine how each of the characteristic components fits into the workflow of the

operation. This understanding provides the context and shows how the component can be measured. It also shows the places in the activity that contribute to the measurement and lets the team know how the **volume, time, quality indicator, etc.,** that are measured for the component will build. This is the key to creating a measurement formula and a measurement warning system - watch key points in the component's measurement and how the measurement builds against thresholds to provide a warning system. In this way, the performance measurement system supports ongoing and real-time reporting against a state that is defined by management as optimal.

Gaining Control

The Infosys approach to delivering optimal Bed Management is a process-based redesign that leverages current applications. This approach uses BPM tools and techniques to first give visibility to the entire process. It pulls component activities from a wide range of operational units and then offers optimization through:

- Process redesign to eliminate operational problems
- Change management to eliminate human resistance to change
- Measurement and performance monitoring to measure and monitor the operation

This approach makes use of advanced process monitoring with real-time dashboards to indicate what is happening at all points in the process and provide alerts based on trends and limits at 'break

points' in the process.

While discussing performance measurement and optimization, we saw how optimization can be defined as a series of components or characteristics and how those characteristics can be associated with business activities to show how work is building in the parts of the operation. Taking this a step further, we can look at the points in the workflow where the activity has a high probability of breaking. From this, we can define what is causing each type of break and begin measuring performance and limits in order to issue warnings around performance-reaching threshold points.

However, this is not an all or nothing approach that disrupts hospital functioning. The approach must be iterative and implementing it must be

as non-invasive as possible. Thus, broad-based acceptance must be garnered from managers and staff which is not possible if the fix is worse than the problem. What must be considered is the need for sustainable improvement and this cannot happen through any one-time project - regardless of what the immediate benefit is. History has proven that disruptive one-time improvement efforts are effective only for short periods and the operation evolves back to the previous way of doing business.

To be sustainable, change must be done with people, not to them. The key is not the initial change, although that must also deliver benefit. The key is a change in approach. Once the advantages of the new operation and measurement system are shown as related to their impact



on each person's job, a re-orientation to a process-centric way of looking at the operation can begin. This delivers sustainable improvement because it makes improvement a daily activity. It helps managers avoid the introduction of undocumented 'white space' work into the activity as workers try to adjust to ongoing needs for change.

Gaining control through this operational management approach thus does not

require that the entire operation be modeled before improvement can begin.

We suggest that the Bed Management process be viewed separately from other hospital operations and corrected alone. Management can then move on to the next process and simply repeat the approach. If standards for modeling, data definition, etc., are created in the Bed Management project, they can be reused and control simply extends as other processes are



Gaining Control

Getting Started

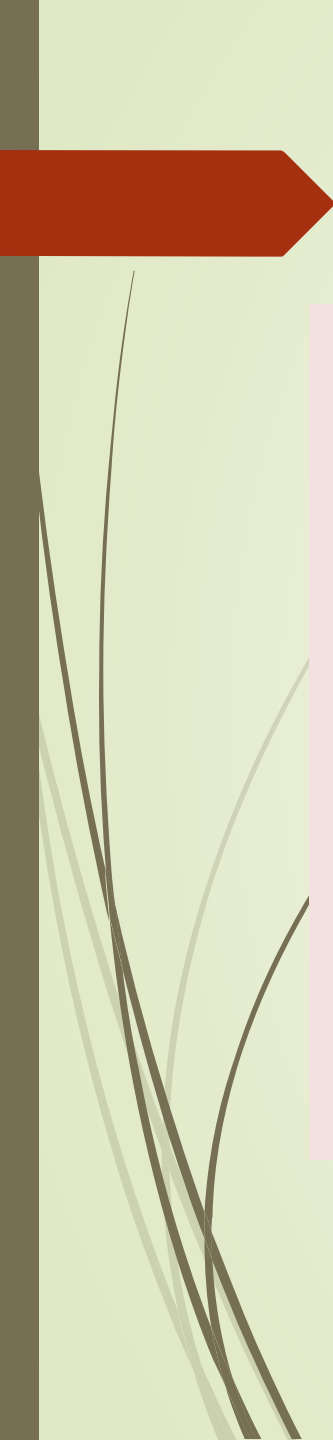
Improving Process and Operational Workflow

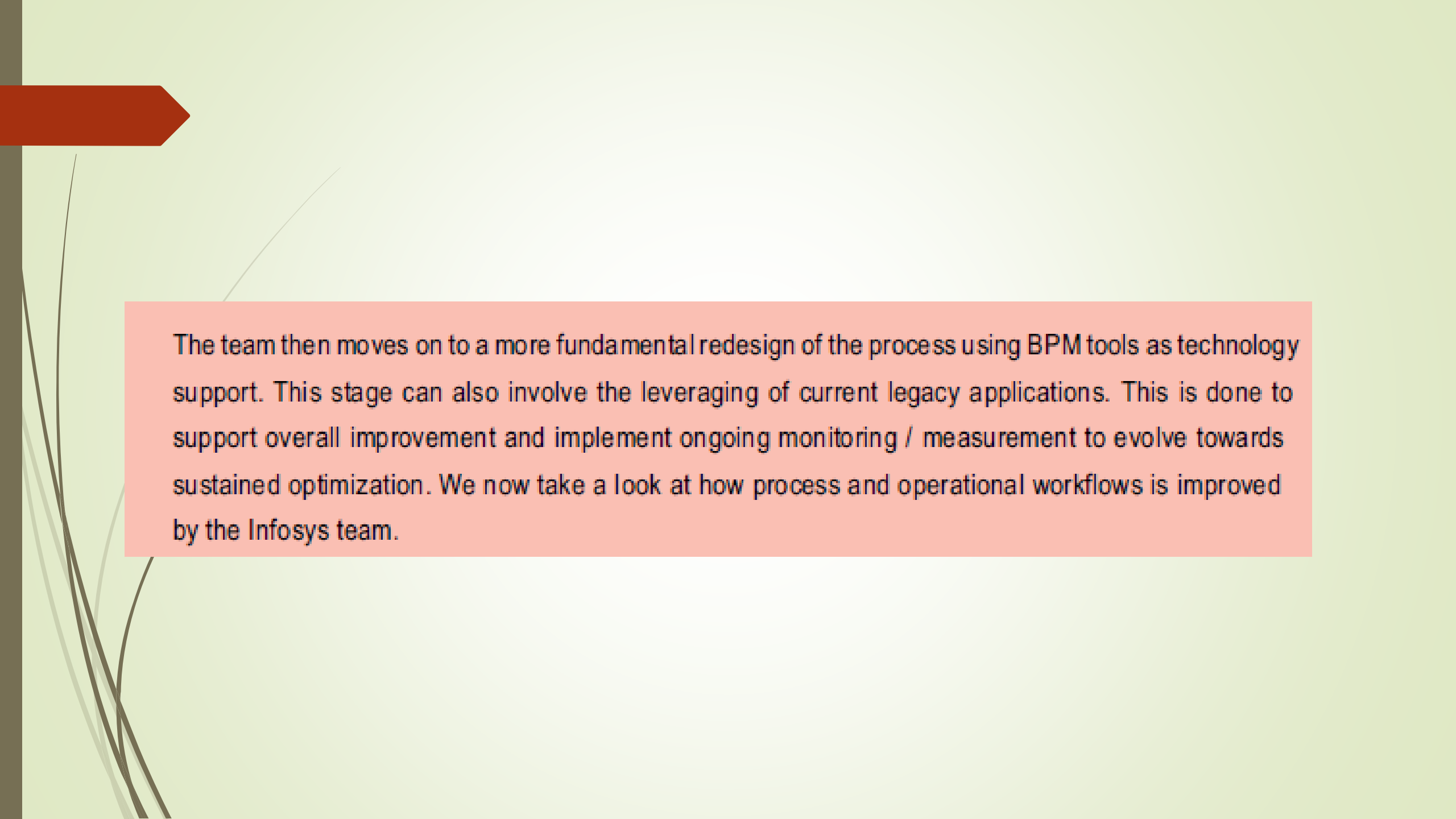
Preparing to Implement Continuous Improvement



Getting Started

1. Bed Management is an activity that spans multiple organization units. It is important to start by creating a complete end-to-end view of all the activities that contribute to the Bed Management process
2. The Infosys team works with the stakeholders to redesign the process first as a 'stop gap' improvement that provides immediate relief by eliminating as many of the Bed Management problems as possible
3. It obtains and implements BPM tools and obtains/writes transformation method and standards
4. The team works with the Bed Management staff and the people who admit patients to create a high level 'as is' process map of the end-to-end Bed Management process. This identifies the feed points, places where IT is used (touch points), and deliverables that come out of the process (including a patient placed in the right bed)
5. The team creates data flow diagrams to show data collection, access, use, transformation and source system

- 
6. It identifies all major problems with the current process and the magnitude of their impact
 7. It identifies opportunities for immediate improvement (the low-hanging fruit as it were) and obtains implementation approval
 8. Next is the designing of immediate improvements and obtaining acceptance from those involved
 9. The team then deploys immediate improvements and measures the improvement
 10. It identifies a significant issue or problem from the Bed Management process and creates a pilot project. This allows hospital managers and staff to become familiar with the business and clinical transformation methods and techniques. Importantly, mistakes, if any, are made in a controlled and limited part of the operation



The team then moves on to a more fundamental redesign of the process using BPM tools as technology support. This stage can also involve the leveraging of current legacy applications. This is done to support overall improvement and implement ongoing monitoring / measurement to evolve towards sustained optimization. We now take a look at how process and operational workflows is improved by the Infosys team.

Improving Process and Operational Workflow

1. Define the high-level, cross-functional 'to be' process maps - indicating how to eliminate all problems, points where errors are introduced, stall points, decision points, application touch points, etc.
2. Define the business and clinical unit workflows that include Bed Management work and create a detailed activity-level new design. Optimize the process and business or clinical units' workflow
3. Identify all legacy and new applications that are involved in the new operation and their relationships - order in the workflow, interaction (integrated by the package, or interfaced), data quality problems, function support, functional deficiencies, access limitations, etc.
4. Create detailed data flow diagrams of what data is used, where, its source, how it flows from application to application, and how it transforms as it moves through the new process
5. Define what data is available and when - data collection and update cycles - especially for batch systems. Design all interfaces from the legacy applications to the Enterprise Application Integration tools (EAI)
6. Redesign the rules that govern activity at a detailed level and define all application change requirements and new functionalities in the way the process is operated, managed, monitored and controlled
7. Determine if the current applications can be changed or if a new application needs to be built
8. Design dashboards and build interfaces to all data bases - begin to monitor the process



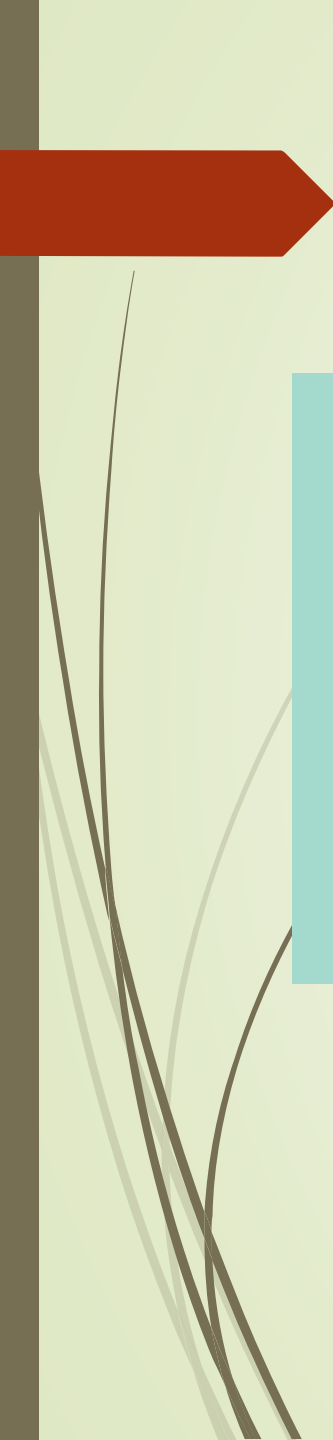
Once the design is completed, the team is in a position to build the new operating environment - process, workflows, applications, interfaces, reports, dashboards, etc.

This delivers an optimal design. However, for financial, political, cultural, and other reasons, it may not be best to move directly to this design. In some cases, it is more productive to create a roadmap that builds to the full design through bite-sized improvements. The key in this construction is to avoid overkill. We suggest that the operation evolves through groups of financially responsible improvements. Each of these improvement evolutions must, however, deliver significant benefits. If the business case for an improvement does not deliver enough benefit, the scope is wrong and it should be rethought.

For example, it may be best to initially find out what is causing the most serious patient-related problems and correct the process and workflows accordingly. As part of this, performance measurement and problem-warning alarms can be easily built into the new operation. Once this is in place, the next step of eliminating delays or financial issues can begin. The sequence must be individualized to the needs of the Bed Management process within a hospital. By creating a new high-level design and then building it through a series of detailed evolutions, the focus can be on high-value improvement while ensuring that the operation is not forced to absorb unacceptable costs of disruption. The following points discuss how the process allows continuous improvements:

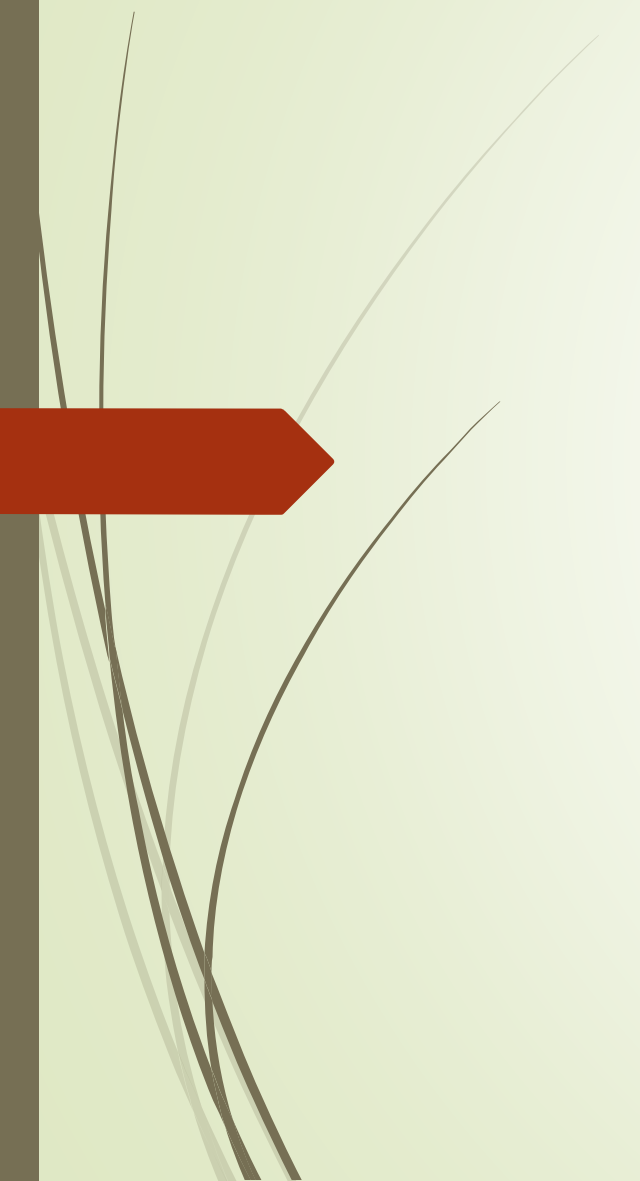
Preparing to Implement Continuous Improvement

1. Enter rules into the Rules Engine
2. Create all data and function-level interfaces to the current applications
3. Plan, construct and implement all new operation capabilities (business activity and IT applications)
4. Build any new data warehouse capabilities and load data
5. Generate the BPM process management and operation applications
6. Live test the operation (processes and scenarios) and the dashboard reporting
7. Train staff and test their proficiency
8. Begin process monitoring - this tells managers if the staff is following the new process and using applications properly
9. Make adjustments based on measurements



In designing and delivering the new operating environment, we suggest that the team fully engage the people who will use the new approach. Not only are they critical in creating workflows, screens, data flow, data transforms and functional requirements, but also in defining what to measure and how to measure.

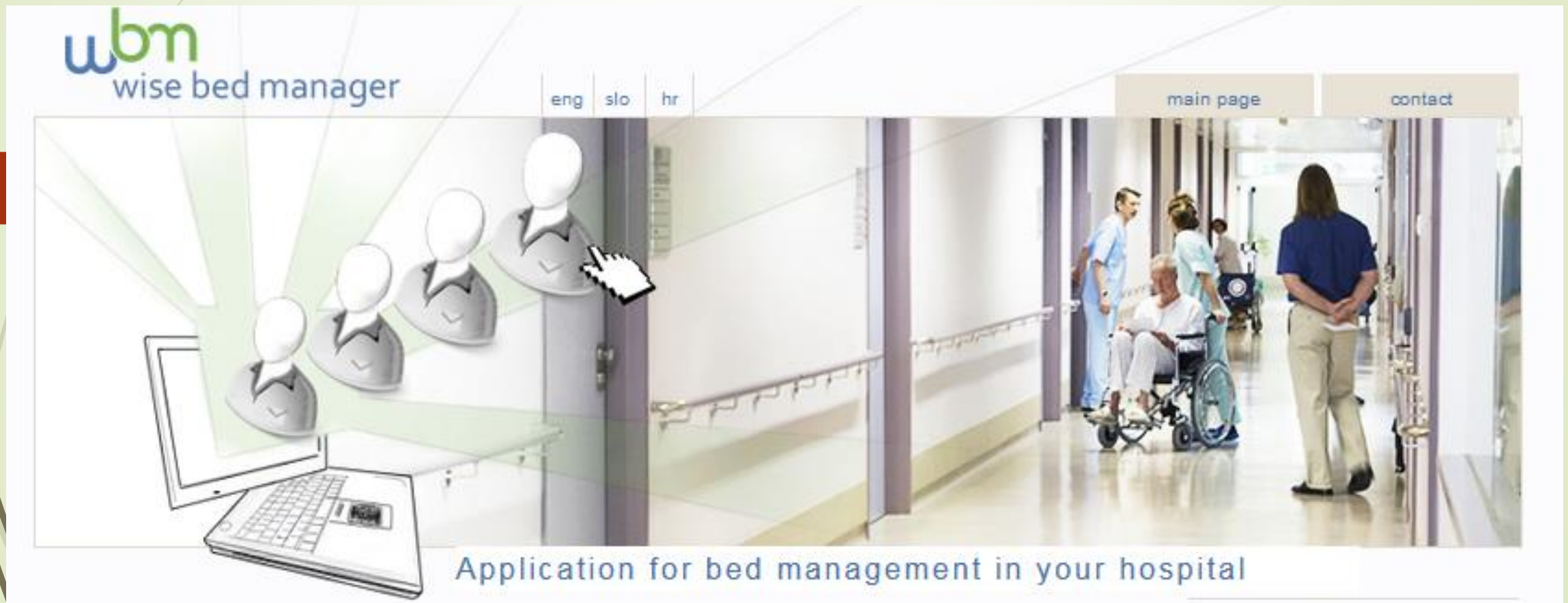
Ongoing improvements should be built on the models and information placed in the BPM tool. This provides a common design and application generation platform for all future changes. In approaching this ongoing improvement analysis, a wide range of techniques can be used, depending on the level of technical sophistication at the hospital's command and its change management group.



Introduce an example of bed management system

<http://www.bed-manager.com/en/technical-description.html>

Bed scheduling is one of the crucial factors in providing services to the end users – patients.



The image shows a screenshot of a web application interface for 'wise bed manager'. The interface includes a logo with the letters 'wbm' in green and 'wise bed manager' in blue. Below the logo, there are three language selection buttons: 'eng', 'slo', and 'hr'. To the right, there are two navigation buttons: 'main page' and 'contact'. The main content area features a graphic of four stylized human figures in business attire, with a mouse cursor pointing at the one on the right. In the background, a photograph of a hospital hallway is visible, showing a patient in a wheelchair being attended to by staff. At the bottom of the interface, the text 'Application for bed management in your hospital' is displayed.

wbm
wise bed manager

eng slo hr

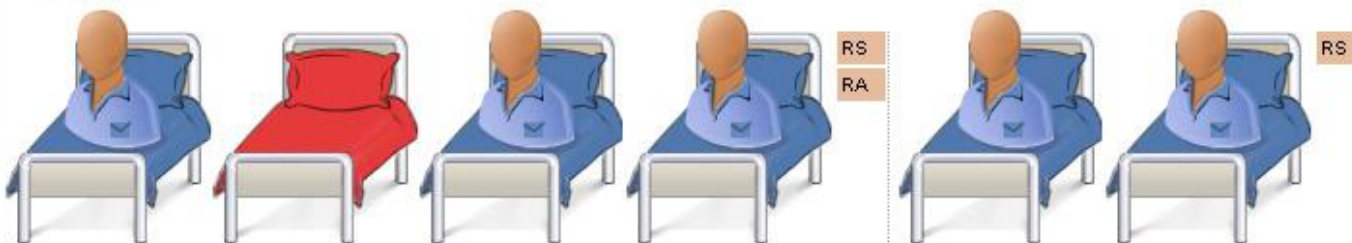
main page contact

Application for bed management in your hospital

Unit: 26, KLIN.ODD.ZA HIPERTENZIJO

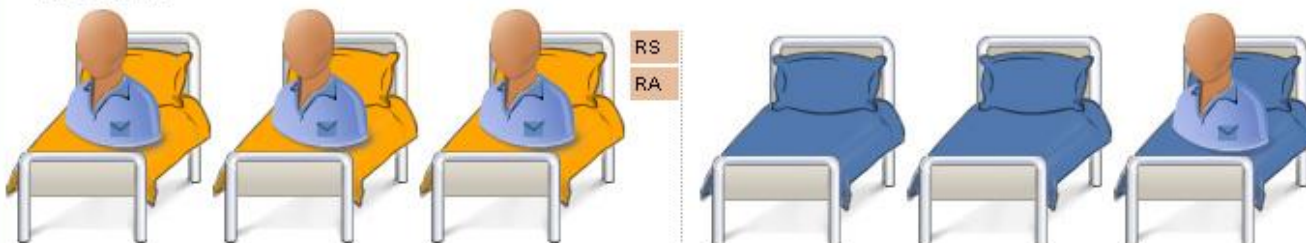
Unit Back to Dashboard View log Log out

Room 1



Room properties:

Room 12



Room properties: SR

Room 14



Room properties:

Room 15

Depository



Filter

1 12 14 15

Room properties

Age: --- all ---

Sex: --- all ---

Room type: --- all ---

Bed properties

Bed type: --- all ---

Bed status: --- all ---

Find a patient

Search

Unit: 26, KLIN.ODD.ZA HIPERTENZIJO

[View log](#)

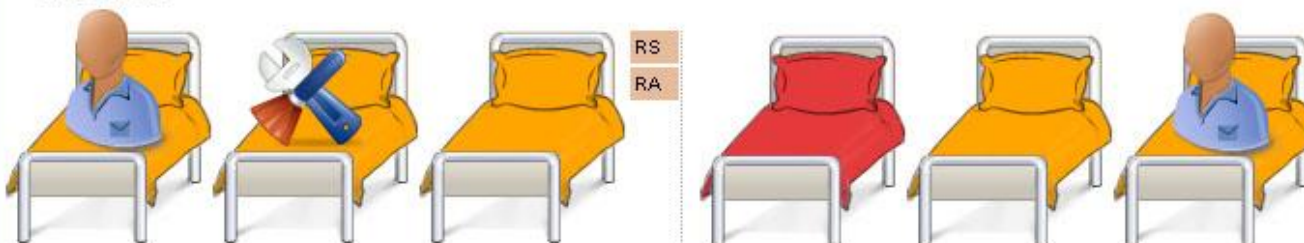
[Log out](#)

Room 1



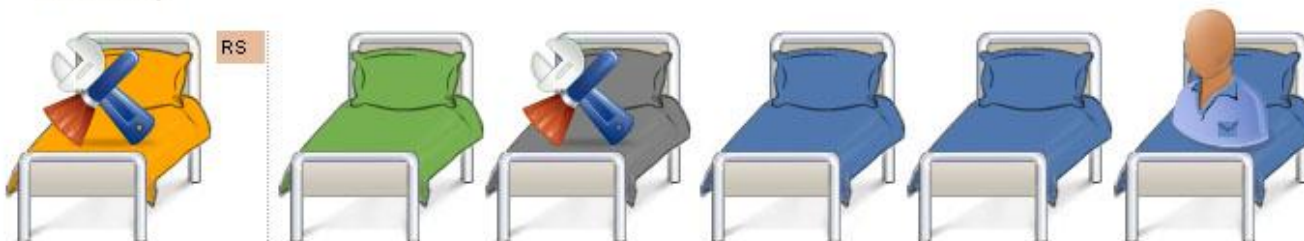
Room properties:

Room 12



Room properties: SR

Room 14



Room properties:

Room 15

Depository



Filter

1 12 14 15

Room properties

Age: --- all ---

Sex: --- all ---

Room type: --- all ---

Bed properties

Bed type: --- all ---

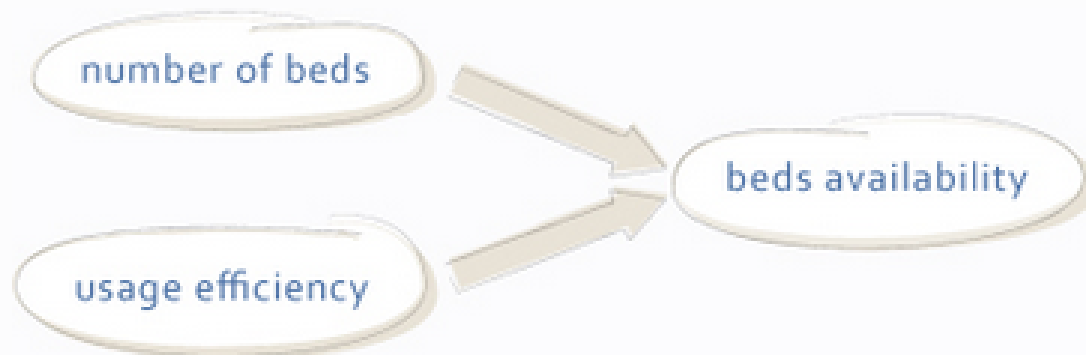
Bed status: --- all ---

Find a patient

Using Wise Bed Manager you get following:

- For emergencies, patient waiting time is greatly reduced
- Lower number of cancelations due to insufficient beds in surgery unit
- Higher number of patient admissions appropriate to their hospitalization needs
- System that can be used without any computer knowledge - use this link to read:

Everything you need to know is in this comprehensive User Manual: [DOWNLOAD](#)



Wise Bed Manager helps improve usage efficiency in this respect.

Availability for certain number of beds can be increased with their higher usage efficiency.

Wise Bed Manager is made in cooperation with E-Health experts, having in-depth expertize about software usability in hospitals.



Benefits and features of Wise Bed Manager

- **Personal is stress-free searching for available beds, especially during emergencies.**
Wise Bed Manager helps better and faster communication between unit for patient admissions, and unit where patients are being finally hospitalized.
- **It improves hospital financial situation.**
Wise Bed Manager provides an overview of bed occupancy in hospital in any given moment.
- **Hospital management has increased competence in terms of communication with their respective employees, health insurance, and media.**
From the obtained data about the bed occupancy Wise Bed Manager creates reports that helps planning process.
- **Reduces the need for inappropriate patient admissions into units due to over occupancy.**
With Wise Bed Manager we have a quick access to all information required for patient scheduling and their hospitalization.

Benefits and features of Wise Bed Manager

- **Shortens patient waiting time during an emergency.**
Ease of use with the graphical data entry.
- **A clear overview of costs and fees related to implementation and use of Wise Bed Manager.**
Software package has no hidden costs, i.e., all required equipment is included in the price of purchased license, the installation and integration into the hospital network, as well as staff training.
- **The equipment is easily incorporated into the working process.**
Wise Bed Manager is simple and easy to use so it can be well accepted among the users.



Benefits and features of Wise Bed Manager

- **Coordinates bed scheduling at the level of entire hospital, and allows unit staff to assign patients to specific beds.**

Bed manager assigns patients to a specific unit, and the unit staff has a further control over that unit.

- **Reduces the number of cancellations for already scheduled patient hospital admissions due to lack of beds.**

Wise Bed Manager enables more accurate allocation of beds for emergency patients based on the historical data.

- **Eliminates unnecessary doctor visits to remote hospital units.**

Due to the lower number of inappropriate patient admissions, reduces number of visits to remote units.



Application usability

During development we took into consideration the burden of personal in units, so Wise Bed Manager has a respect for your time.

Ease of use and a good overview of the work were the primary features that we had in mind when developing this project.



Application usability

➤ Training

Training for every single user.

➤ User-friendly interface

All necessary information fits on one screen.

➤ Orders execution speed

Most actions are completed within seconds, and with a single mouse click.

➤ Simplicity of actions

All orders are defined in a detail, and consist of very few steps.

Application users



Wise Bed Manager is an application which to the customer satisfaction increases beds availability in hospitals had they 30 or 3000 beds.

Wise Bed Manager is designed for three groups of users. Each of these groups has an access to the system.

Application users

1- Unit user

"Unit user" module is a graphical user interface which acts as a bed manager for each hospital unit individually. Simple "**drag-and-drop**" data entry mechanism allows the unit user to admit the patient, i.e., with a single mouse click.

A user with the user type nurse can:

- add new patients
- move patients between rooms and beds of her/his unit
- update the patient's data
- discharge the patients
- propose to the bed manager to transfer the patient to another unit
- update the bed statuses
- change the equipment at the beds

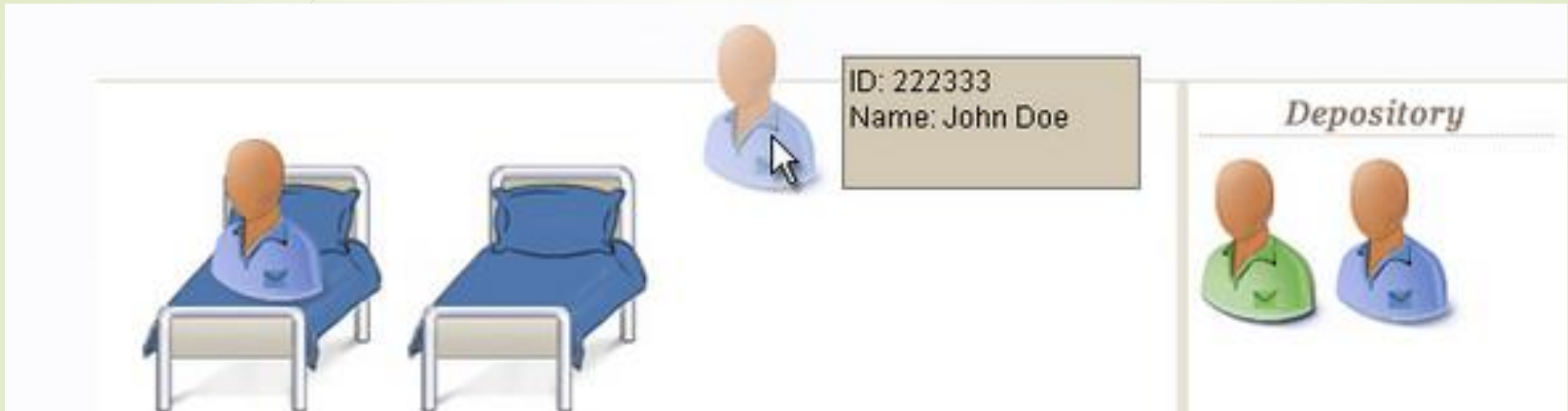
Application users

2- Hospital management

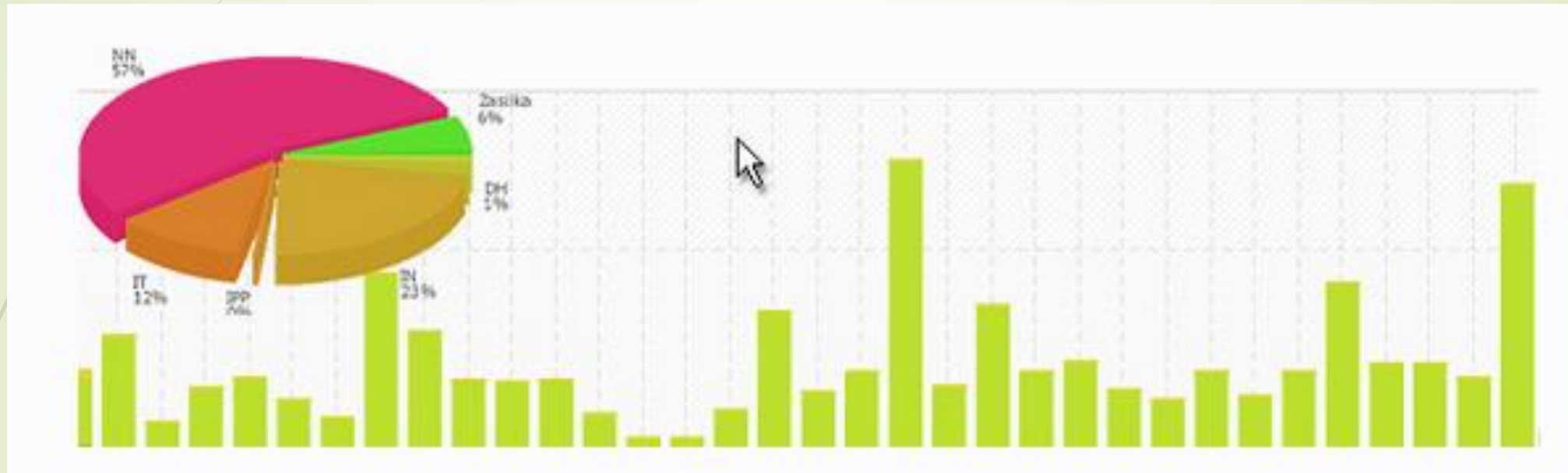
Wise Bed Manger provides hospital managements with following:

- Overview of current bed occupancy at all levels (hospital, unit, room, bed)
- Overview of bed occupancy over any given period
- Statistics and analysis

Unit user



Hospital management



Application users

3-Bed manager

With module for central bed management, user can make quick and detailed search for unoccupied capacities and reservations of beds at selected units. For any action made from this module, user gets return information about execution status. "Bed manager" module performs among the other, following operations:

- Monitoring of available and occupied capacities for any unit
- Patient management (adding patients, editing patient data)
- Transfer of patients between hospital units
- Making reservations of suitable beds according to bed characteristics and equipment
- Review of all previous actions for hospital units.

Application users

3-Bed manager.....

The Bed manager's primary role is to:

- admit patients into the clinic,
- reserve beds for patients,
- assign the patients to appropriate units,
- move the patients between different units.

He is also able to:

- move the patients between beds inside the unit,
- discharge the patients.

Bed manager

USER LIST

Add new user

Search for:

Select/Unselect all Delete selected

			First name	Last name
Edit	View	☐	Michael	Scot

PATIENT LIST, ADD

[< Back to list](#)

SSN	222333	*
First name	John	
Last name	Doe	
Date of birth	25 04 1955	

Implementation

To the customer satisfaction, quick learning process has simplified application implementation. Wise Bed Manager will be implemented into your hospital working process quickly and easily. It consists of three steps:

- Technical implementation and security
- User training
- Wise Bed Manager implementation into working process



1-Technical implementation and safety

- Wise Bed Manager software package includes the server, which will be incorporated into your hospital network. It requires web browser, which comes as a standard on most computers today.
- We guarantee data access security by widely accepted international standards, such as HTTPS data encryption, data encryption on the centralized database and others.

2-User training..... Unit user

This module, which allows patients assignments within the unit, uses majority of users. Course offered by instructor takes 1 hour, and is designated to a group of 10-15 participants.

Program:

- How the system works and its benefits
- Logging in and logging out from the application
- User interface
- Admission, discharge and transfer of patients
- Changing the bed status and bed equipment
- Special examples on using help
- Independent work: executing 3 scenarios of application usage

2-User training..... Bed manager

Bed manager module is the administrative module, which has access to resources throughout the hospital and improves patient primary schedule within units. Training is offered by instructor and takes 2 hours with 1 or 2 participants.

Program:

- The system functions and its uses
- User interface
- Units, rooms, and beds management
- Admissions, discharge, and transfer of patients
- Monitoring order implementations inside units
- Specific examples with support from manual
- Independent work: executing typical scenarios of application usage with admission, discharge and transfer of patient

2-User training..... Executive user

Executive user module is used for monitoring, and provides hospital statistical data required for analysis of hospital resources. Training is offered by instructor and takes 2 hours with 1 or 2 participants. *Program:*

- Using and viewing charts
- Analyzing statistical data from the charts
- Monitoring bed occupancy at the hospital
- User interface
- Viewing hospital resources in terms of units, rooms, and beds

3- Incorporating Wise Bed Manager into working process

- Wise bed Manager functions only if it has correct data, that's why incorporation into working process is a crucial part of the implementation.
- Before the implementation, your hospital data including units, rooms, bed types and their equipment has been entered.
- We can incorporate the system into the working process gradually, one by one unit, or all of them at once. In both cases, implementation occurs transparently without any work interruptions within the units. All required data gets gathered during one day – the daily status. When this is completed, we save all changes, and in the moment when least expected, we switch the system on, and it's immediately ready for use.

System requirements

Wise Bed Manager is installed at the single location (server) in hospital. Wise Technologies provides also hosting option, so there can be any equipment for the application inside the hospital.

- From the central server (located in hospital or hosted by Wise Technologies), internet application is provided through the network to all unit computers (clients).
- Minimum configuration:
- PC computer or any other internet browser capable computer
- 512 MB RAM
- 2 GB free disk space
- Software installed: any OS with Internet Explorer 7 (or later) or Mozilla Firefox 3 (or later)
- Screen resolution: at least 1024×768px

USER LIST, ADD NEW RECORD

< Back to list

Login	Michael	*
Password		*
First name	Michael	*
Last name	Scot	*
User type	Bed Manager ▼	*
Unit Name	27 ▼	
Email	michael.scot@ukc.com	
Phone	01 37 552 32	*

* - Required field

BED EQUIPMENT

[Go to Settings page](#) | [Dashboard](#)Logged in as **admin**[Log out](#)[Add new bed equipment](#)Total bed equipments found: 2
Page 1 of 1

Records per page:

20 [Select/Unselect all](#) [Delete selected](#)

		Short Name	Equipment Name	Equipment Description
Edit	☐	RS	respirator	
Edit	☐	RA	reanimator	

SETTINGS PAGE

[Back to Dashboard](#)

Logged in as **admin**

[Log out](#)

sub menu:

[Maintain Bed Types](#)

[Maintain Bed Status](#)

[Maintain Bed Equipment](#)

[Maintain Colors](#)

Total rooms displayed at one time

1

[Edit](#)

Total beds displayed at one time

1

[Edit](#)

Number of beds shifted to the left

1

[Edit](#)

Number of beds shifted to the right

1

[Edit](#)

Login session duration time in minutes

30

[Edit](#)

USER LIST

Go to [Dashboard](#) | Logged in as **admin** | [Log out](#)

[Add new user](#)
Search for:

Total users found: 4
Page 1 of 1
Records per page:

[Select/Unselect all](#) [Delete selected](#)

			First name	Last name	User type	Unit Name	Active
Edit	View	☐	Michael	Scot	System Administrator		Yes
Edit	View	☐	Steve	Smith	Executive Manager		Yes
Edit	View	☐	Bruce	Robertson	Bed Manager		Yes
Edit	View	☐	Cindy	Love	Nurse	26	Yes



Main menu:

Clinics View

Units View

Rooms View

Beds View

Occupancy

Beds by Clinic

Beds by Unit

Beds

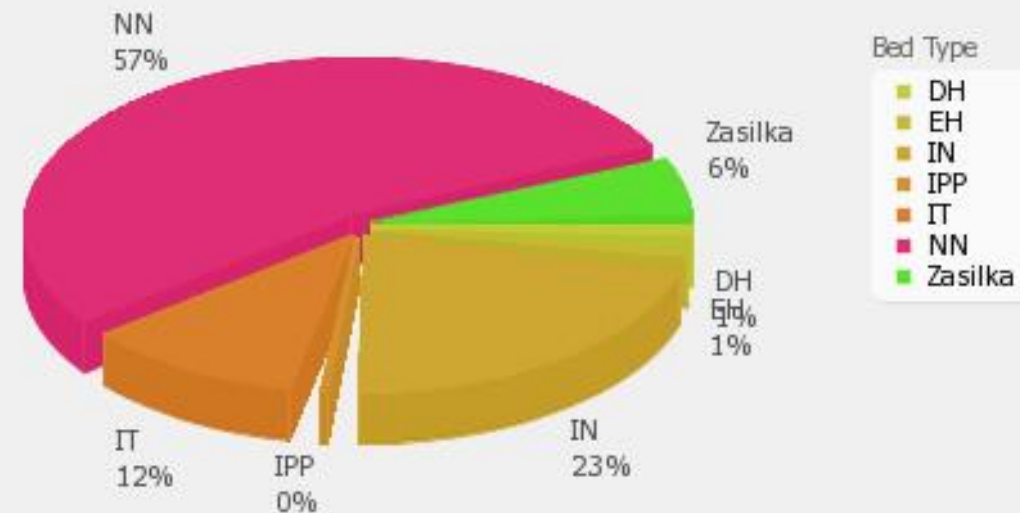
Users

[Bed Type]

[Bed Status]

[Bed Equipment]

HOSPITAL ALL



BED MANAGER DASHBOARD

[Change Password](#)
[Logged in as bedmanager](#)
[Log out](#)

Main menu:

[Job List](#)
[Edit Patients](#)
[Bed Reservation](#)
[View log](#)

Units <i>(Total number: 59)</i>	Total Beds	Free Beds	In Use (%)	Reserved Beds	Pending Jobs	
26, KLIN.ODD.ZA HIPERTENZIJO	40	36	5.00	1	0	Jump to unit
27, KLIN.ODD.ZA ŽILNE BOLEZNI	57	56	1.75	0	0	Jump to unit
28, KLIN.ODD.ZA INTENZIVNO INTERNO MEDICINO	14	13	7.14	0	0	Jump to unit
29, KLIN.ODD.ZA KARDIOLOGIJO - A	31	31	0.00	0	1	Jump to unit
29, KLIN.ODD.ZA KARDIOLOGIJO - B	36	35	0.00	1	0	Jump to unit
29, KLIN.ODD.ZA KARDIOLOGIJO - C	25	25	0.00	0	0	Jump to unit
29, KLIN.ODD.ZA KARDIOLOGIJO - D	0	0	0.00	0	0	Jump to unit
30, CENTER ZA PLJ.BOL.IN ALERGIJO	16	16	0.00	0	0	Jump to unit
31, KLIN.ODD.ZA GASTROENTEROLOGIJO	88	88	0.00	0	0	Jump to unit
32, KL.ODD.ZA ENDOKRINOLOGIJO	59	59	0.00	0	0	Jump to unit
33, KLIN.ODD.ZA NEFROLOGIJO	35	35	0.00	0	0	Jump to unit
34, KLIN.ODD.ZA REVMATOLOGIJO	34	34	0.00	0	0	Jump to unit
35, KLIN.ODD.ZA HEMATOLOGIJO	35	35	0.00	0	0	Jump to unit
93, CENTER ZA VOJNE VETERANE	18	18	0.00	0	0	Jump to unit
94, CENTER ZA ZASTRUPITVE	6	6	0.00	0	0	Jump to unit
96, INTERNISTIČNA PRVA POMOČ	6	6	0.00	0	0	Jump to unit
47, KL.ODD.ZA KIRURŠKE INFEKCIJE	20	20	0.00	0	0	Jump to unit
48, KL.ODD.ZA KRG SRCA IN OŽILJA	69	69	0.00	0	0	Jump to unit
49, KL.ODD.ZA TORAKALNO KRG	29	29	0.00	0	0	Jump to unit
50, KL.ODD.ZA PLASTIČNO, REKONST.	39	39	0.00	0	0	Jump to unit
51, KL.ODD.ZA OTR.KRG IN IT	144	144	0.00	0	0	Jump to unit
52, KL.ODD.ZA MAKS.IN ORALNO KRG	32	32	0.00	0	0	Jump to unit
53, KL.ODD.ZA TRAVMATOLOGIJO - A	72	72	0.00	0	0	Jump to unit
53, KL.ODD.ZA TRAVMATOLOGIJO - B	39	39	0.00	0	0	Jump to unit
53, KL.ODD.ZA TRAVMATOLOGIJO - C	44	44	0.00	0	0	Jump to unit
53, KL.ODD.ZA TRAVMATOLOGIJO - D	30	30	0.00	0	0	Jump to unit
53, KL.ODD.ZA TRAVMATOLOGIJO - E	25	25	0.00	0	0	Jump to unit
53, KL.ODD.ZA TRAVMATOLOGIJO - F	39	39	0.00	0	0	Jump to unit
54, KL.ODD.ZA NEVROKIRURGIJO - A	27	27	0.00	0	0	Jump to unit

Dashboard

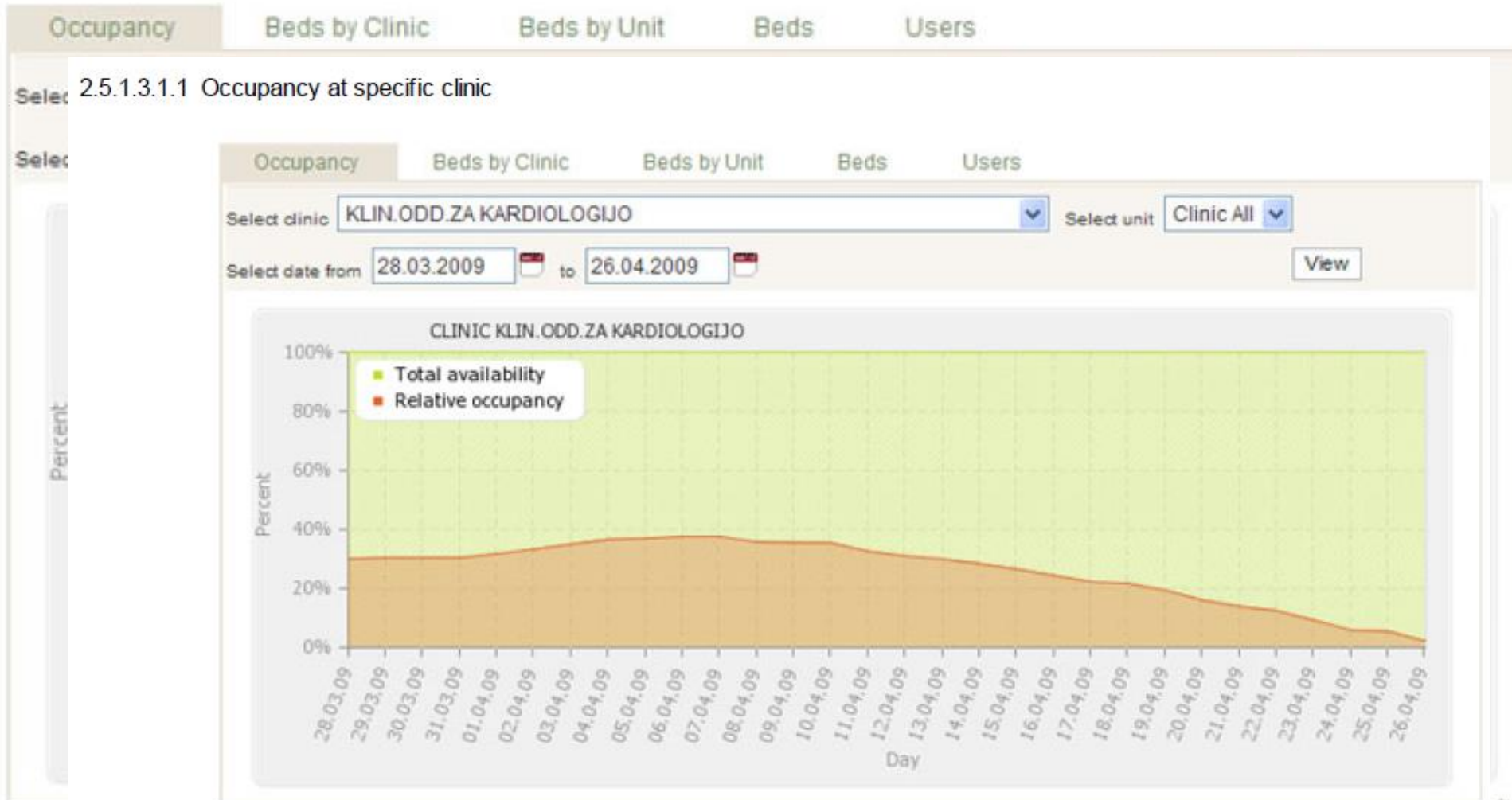


Each tab at the top represents specific type of hospital statistics:

Activate Windows
Go to PC settings to activate Win

- 
- ☐ Occupancy displays total number of beds that are occupied in percentages over specified time interval at the hospital, clinic, or unit level
 - ☐ Beds by Clinic is divided into:
 - Bed Type
 - Bed Status is selected by default
 - ☐ Beds by Unit is selected by default and is divided into:
 - Bed Type
 - Bed Status is selected by default
 - ☐ Beds contains data for entire hospital and is divided into:
 - Bed Type
 - Bed Status
 - ☐ Bed Equipment
 - ☐ Users displays user type data for entire hospital

Occupancy



By de
the p

You can view relative bed occupancy for a specific clinic by selecting it from 'Select clinic' drop-down list. Make sure 'Clinic All' value is selected from 'Select unit' drop-down list in order to obtain data for entire clinic.

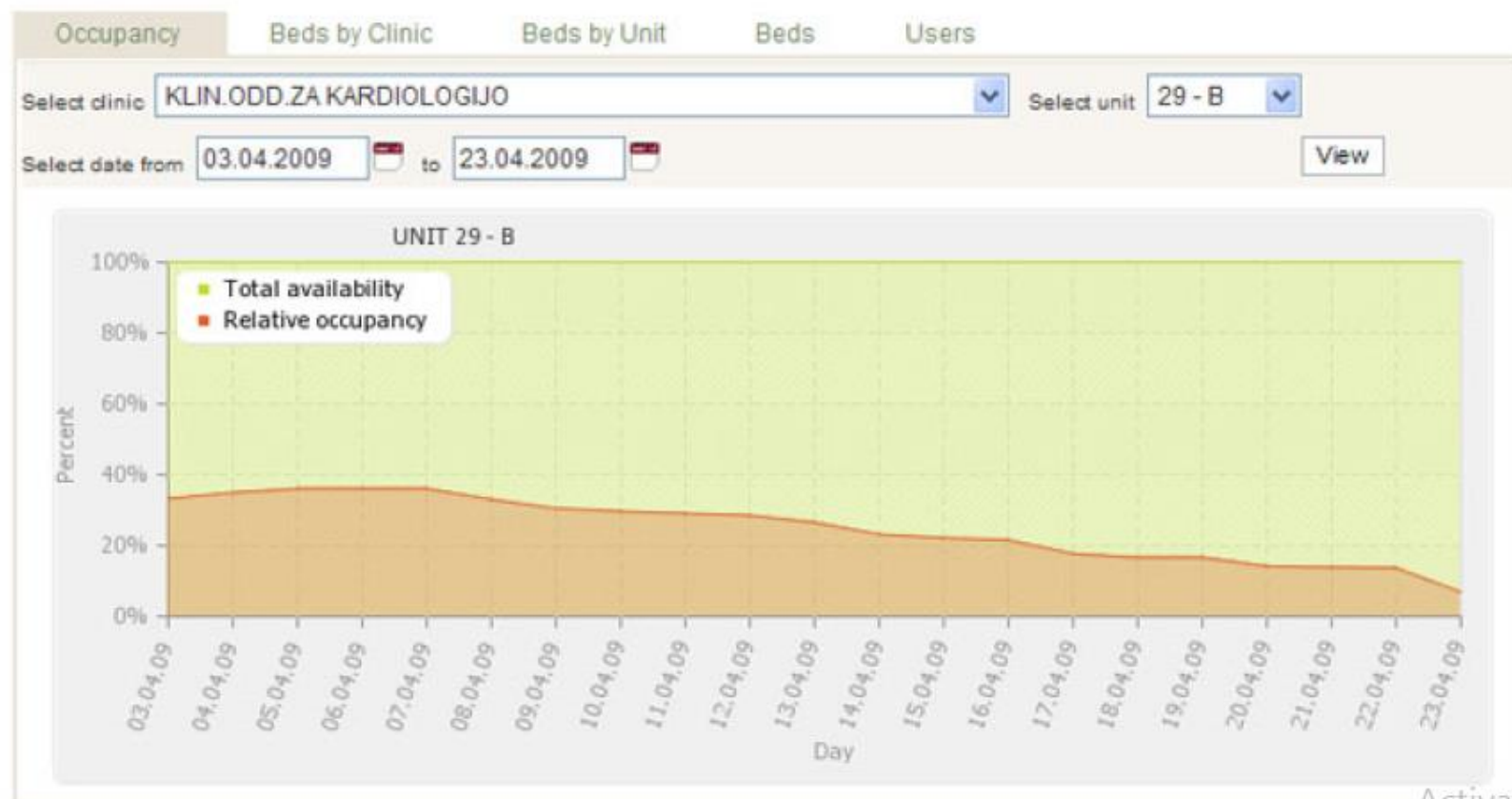
Windows
To activate Wind
To PC s

2.5.1.3.1.2 Occupancy at specific unit



You can view relative bed occupancy for a specific unit by selecting it from 'Select unit' drop-down list. Clinic that this unit belongs to must be pre-selected from 'Select clinic' drop-down list in order to be able to see that unit.

2.5.1.3.1.5 Occupancy at specific time interval



Date interval can not exceed 30 days, and must be specified in the past.

Activate
Go to PC se

2.5.1.3.2 Bed status by clinic



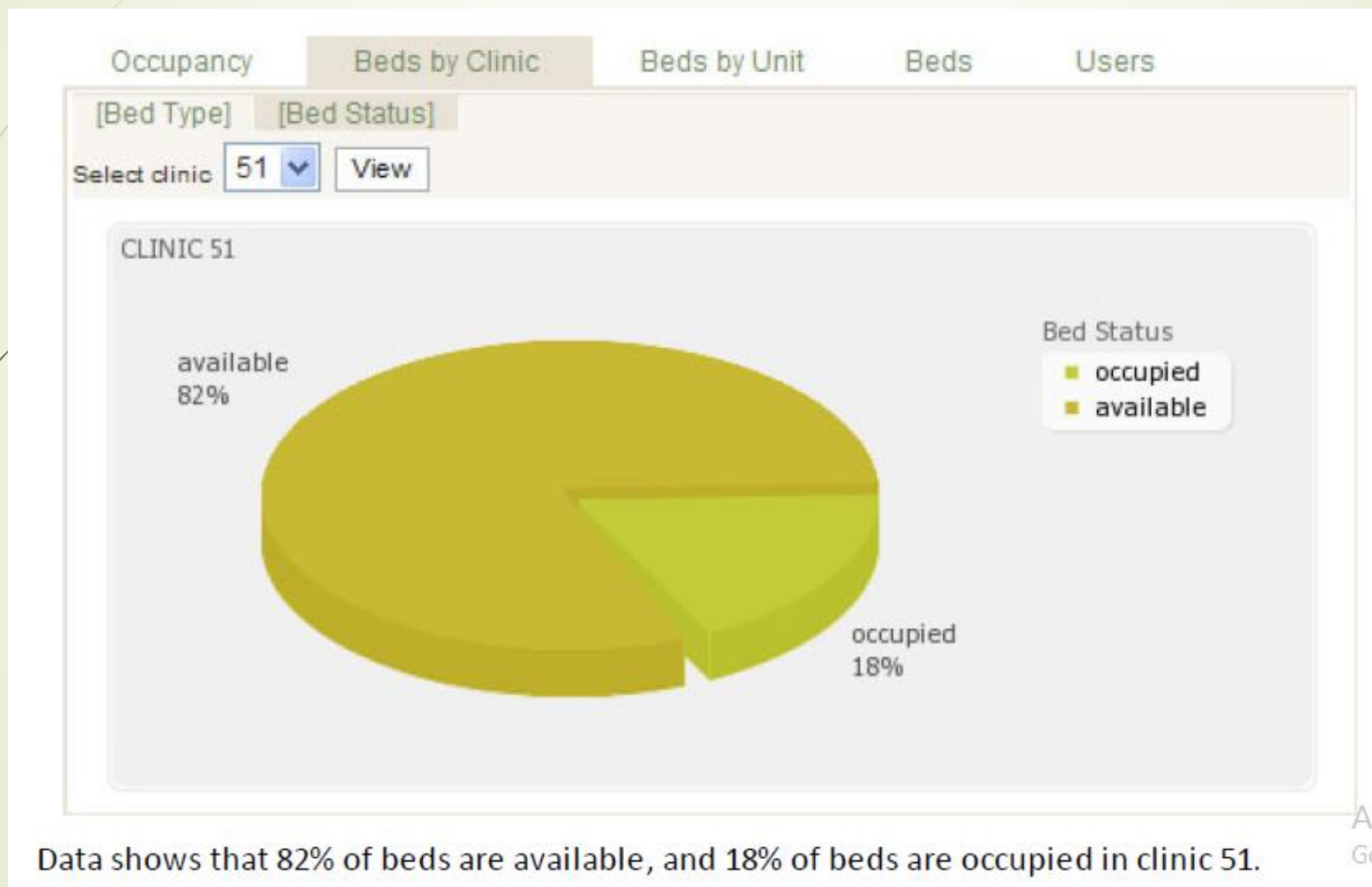
Bed Status by Clinic displays number of occupied and available beds for each clinic as a bar chart.

2.5.1.3.2.1 Select clinic

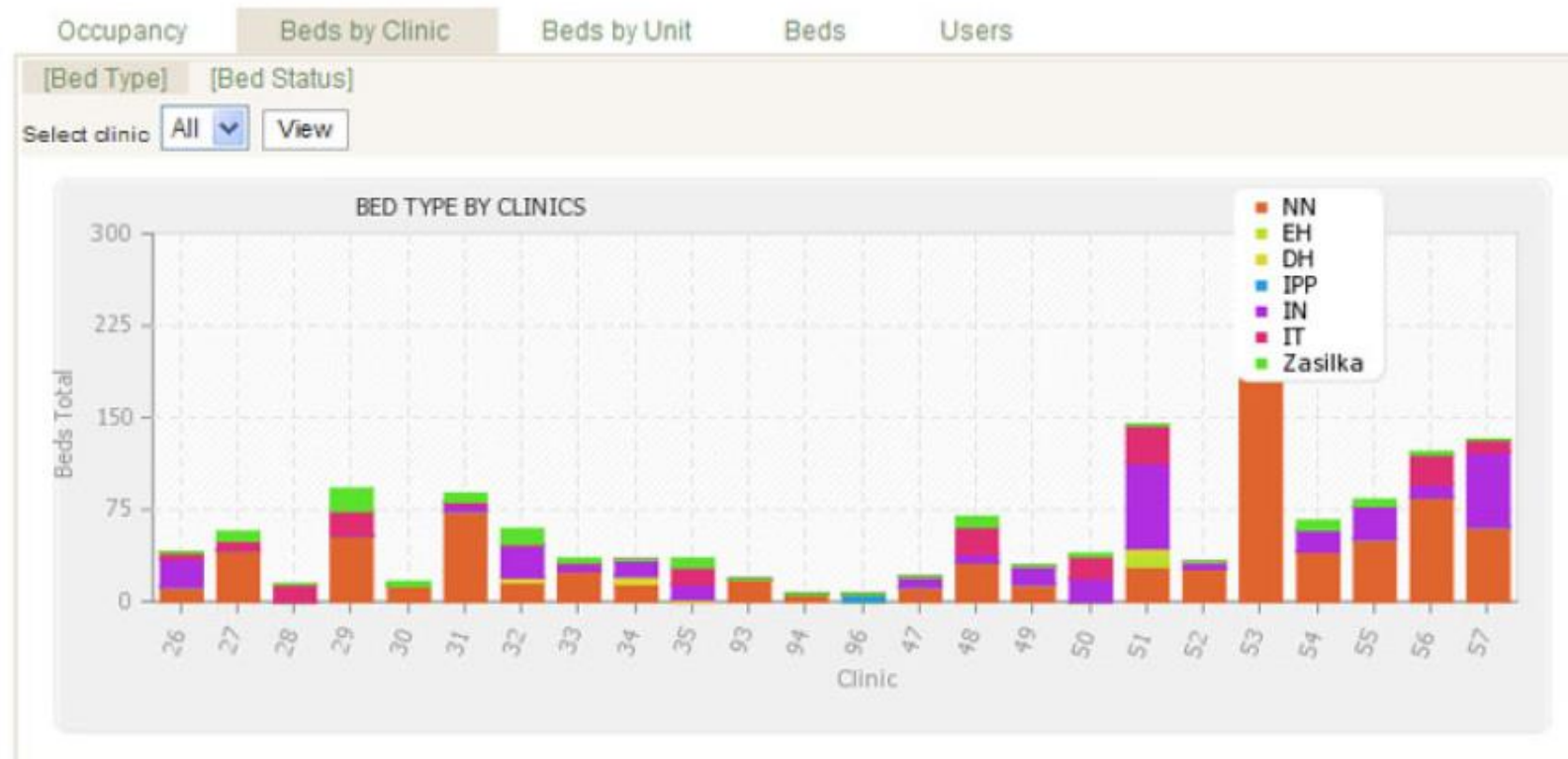


You can select specific clinic from 'Select clinic' drop-down list to get detailed bed status information for that clinic.

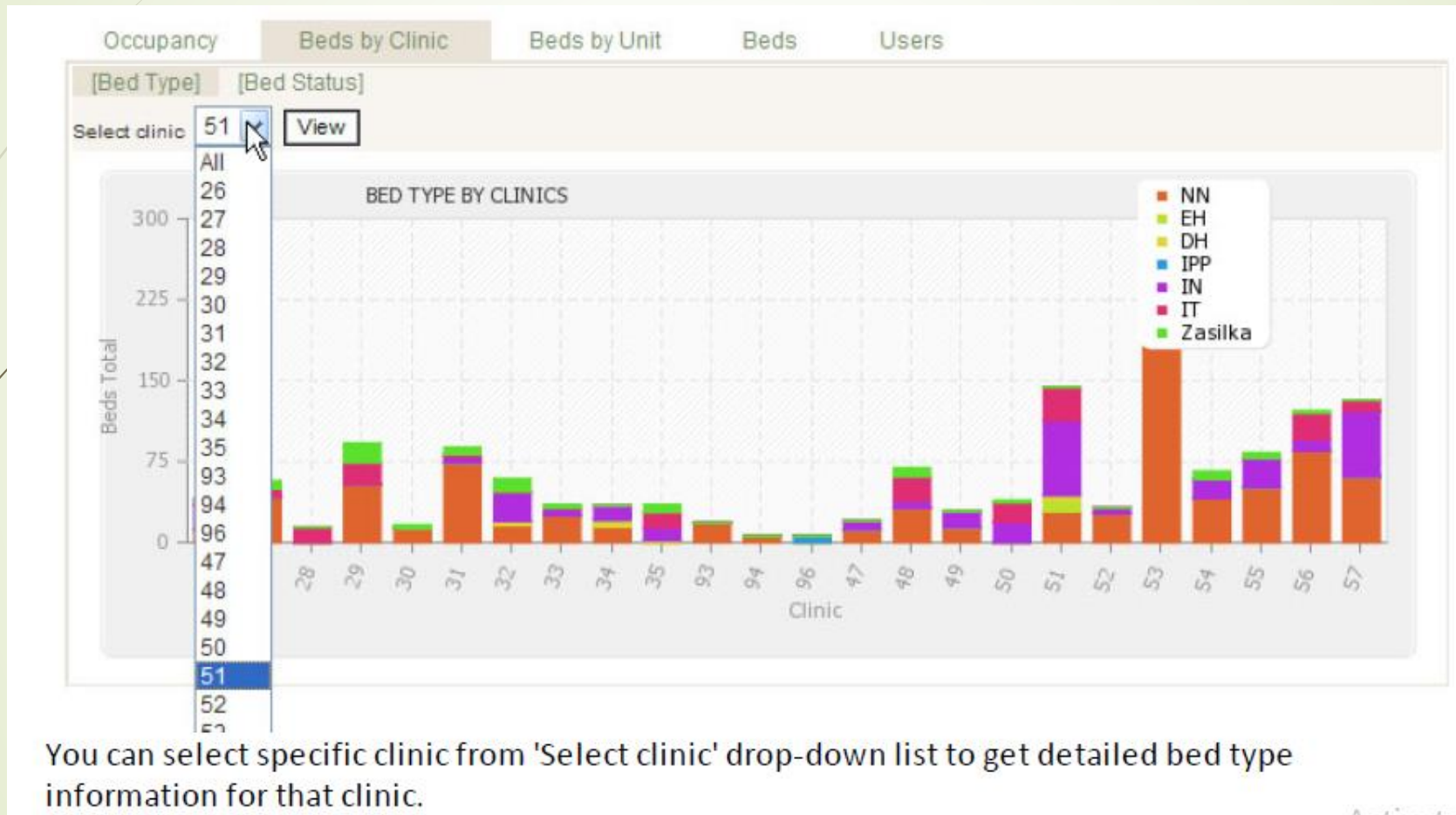
Activate Wi
Go to PC settin

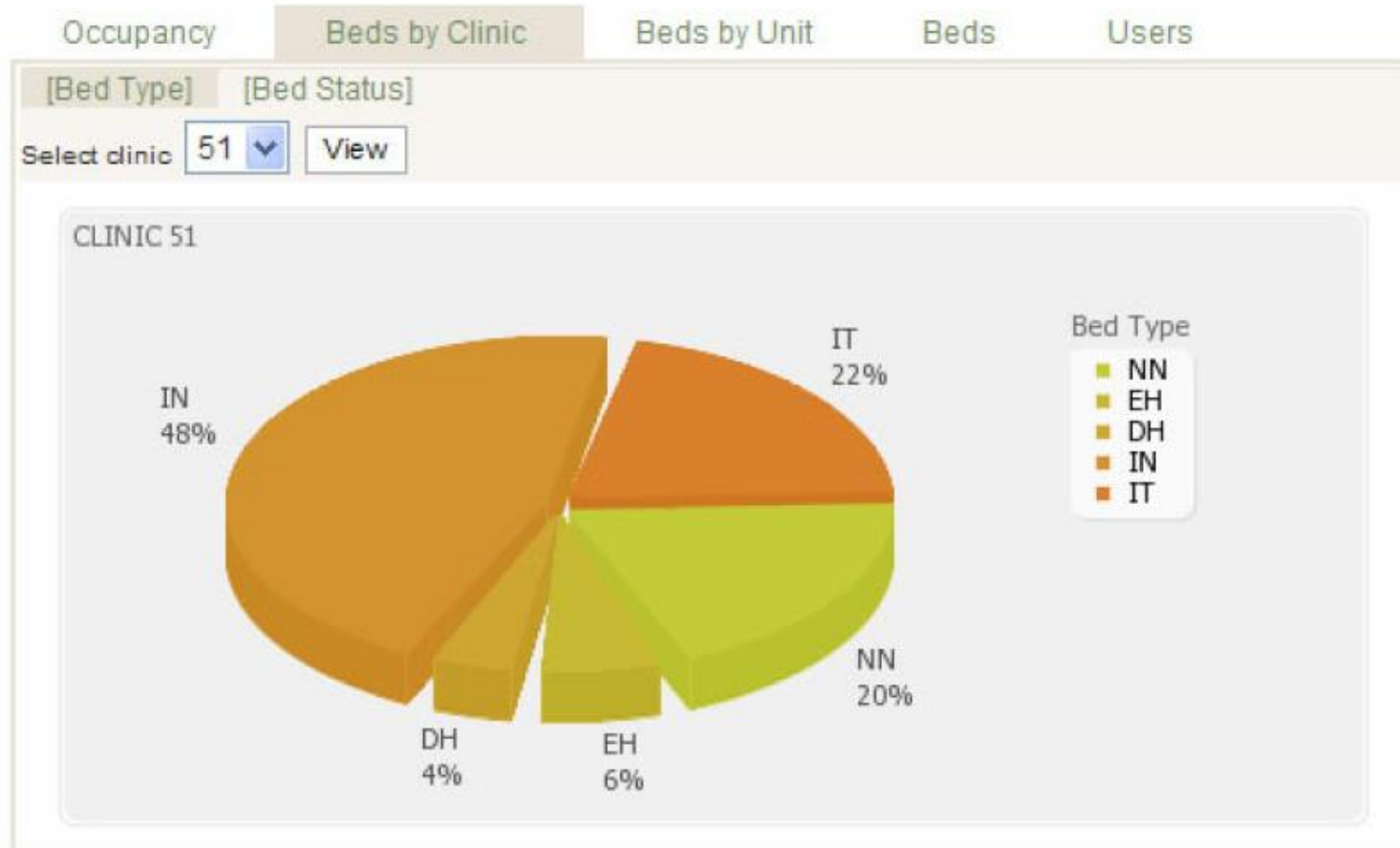


Bed type by clinic



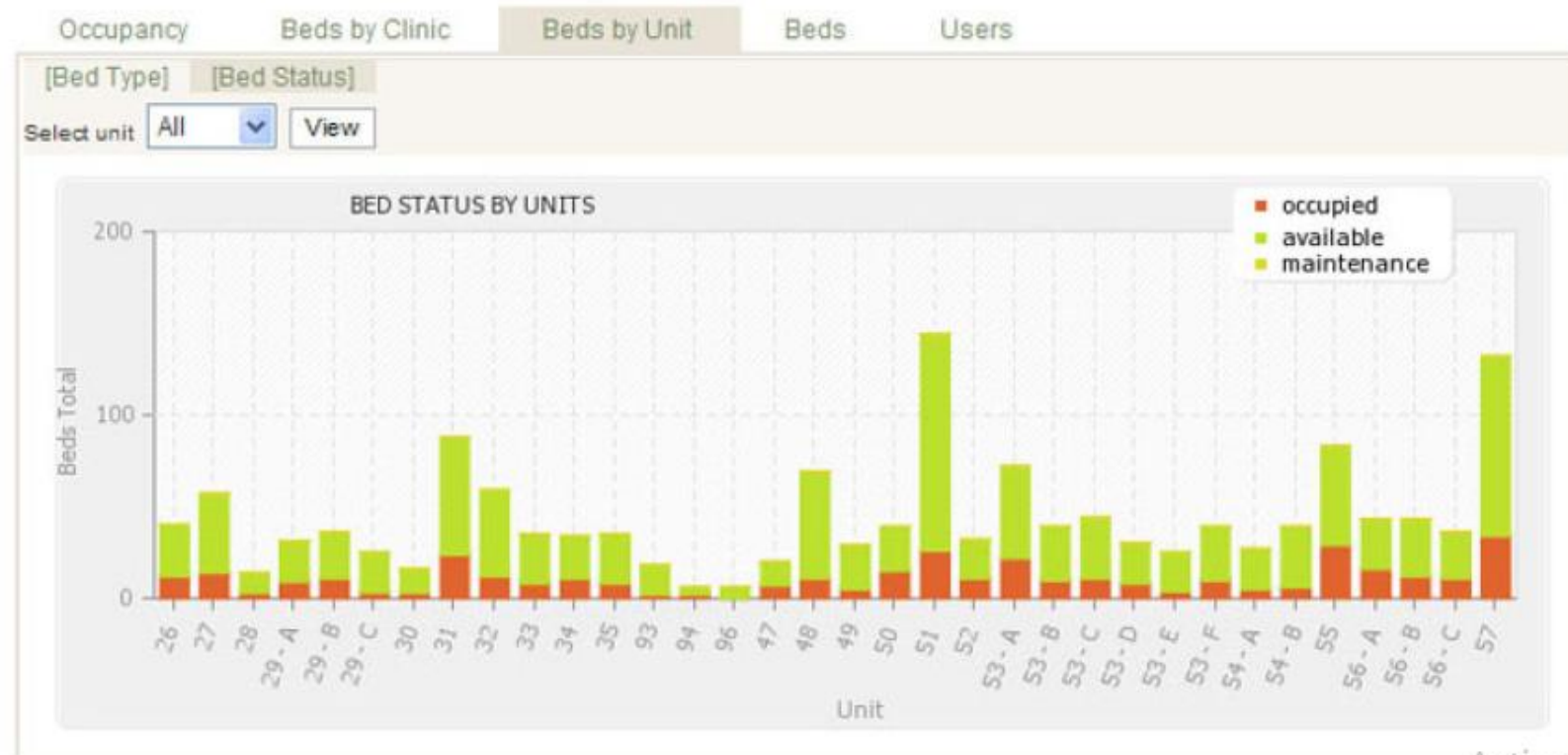
Bed Type by Clinic displays total number for each bed type in each clinic as a bar chart.





Data shows that 48% of beds are IN, 22% are IT, 20% are NN, 6% are EH, and 4% are DH bed type in clinic 51.

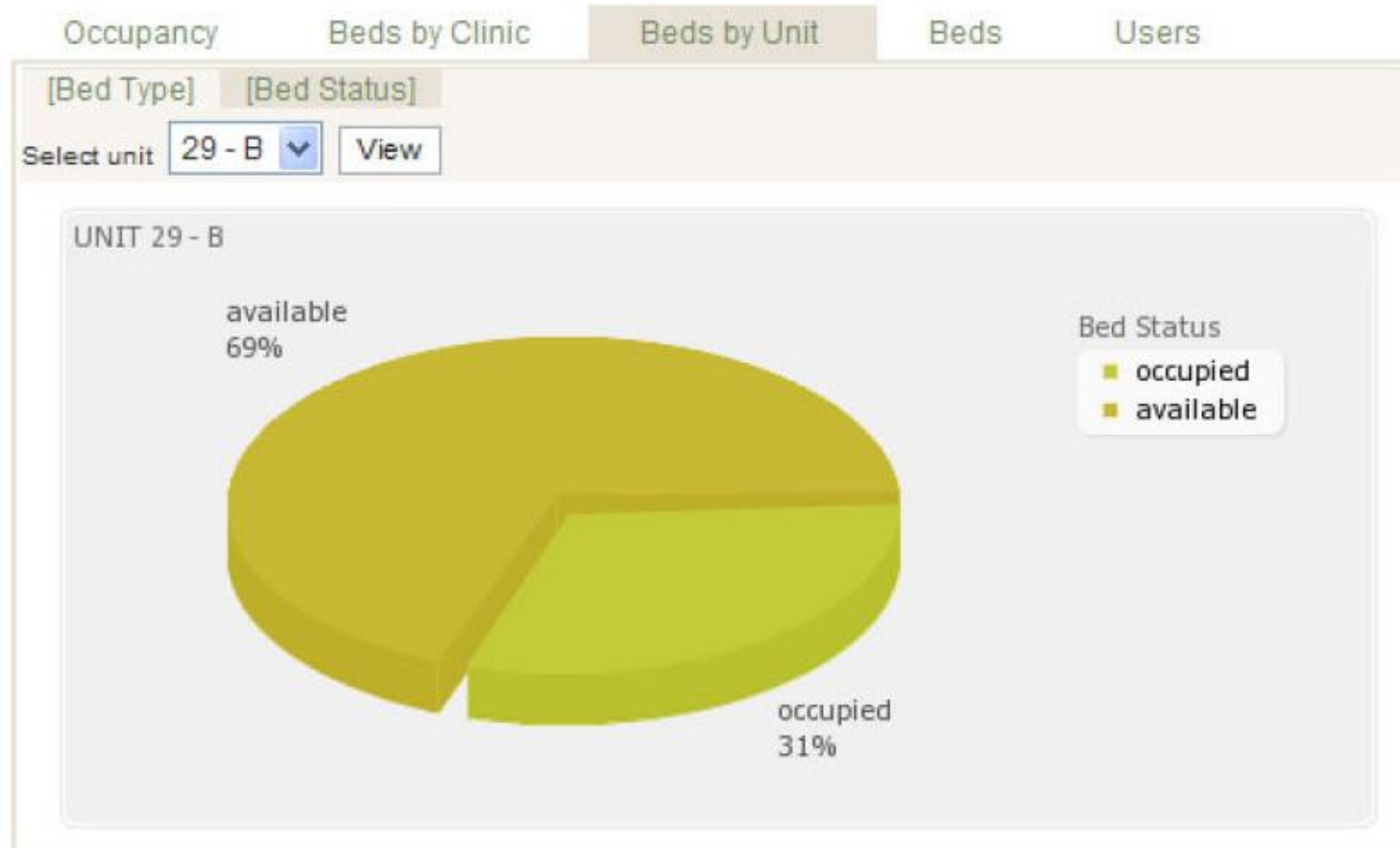
2.5.1.3.4 Bed status by unit



Bed Status by Units displays number of occupied and available beds for each unit as a bar chart.

Activate
on PC s

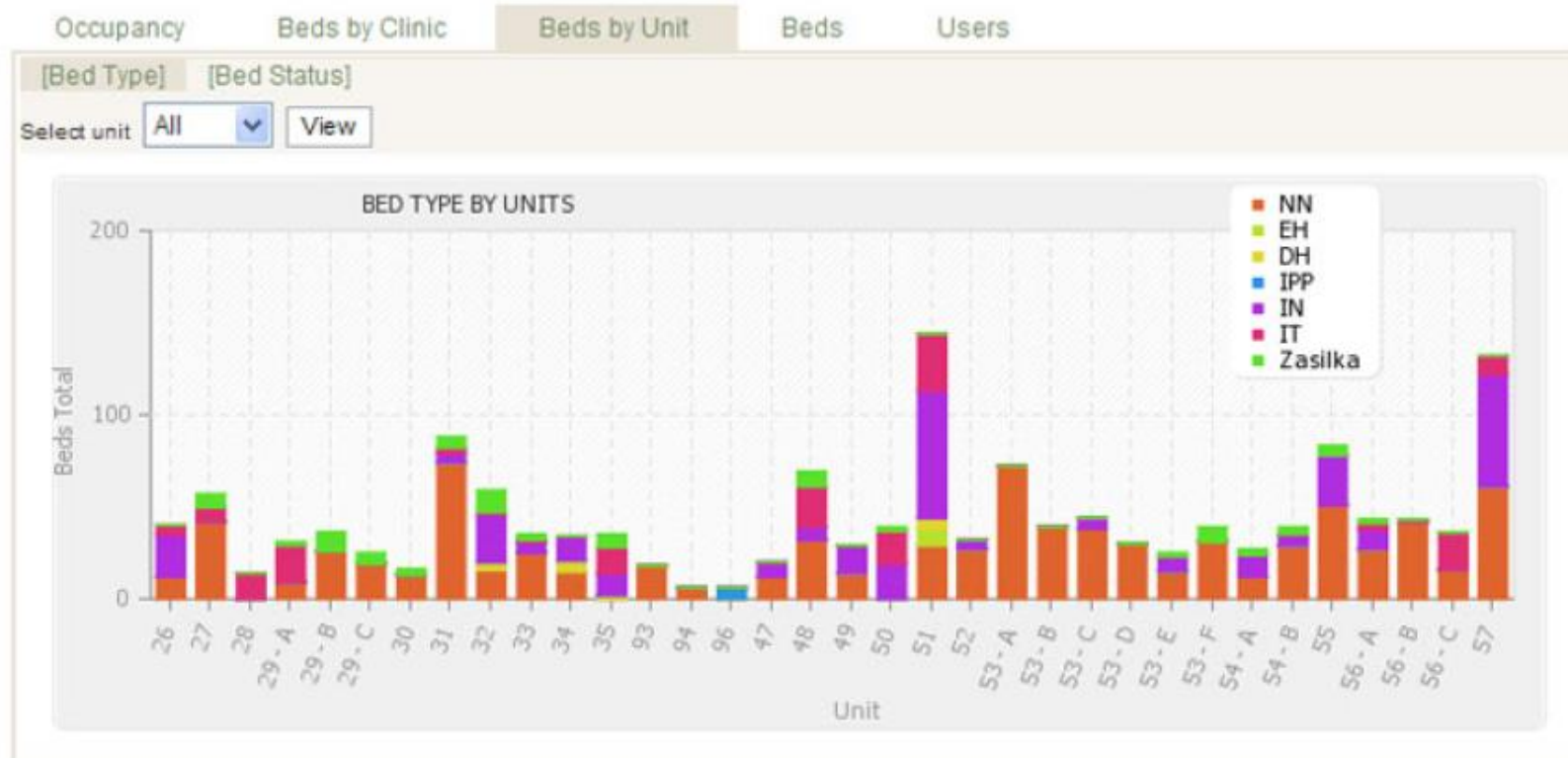
2.5.1.3.4.2 Bed status at specific unit



Data shows that 69% of beds are available, and 31% of beds are occupied in unit 29-B.

Activa
Go to Po

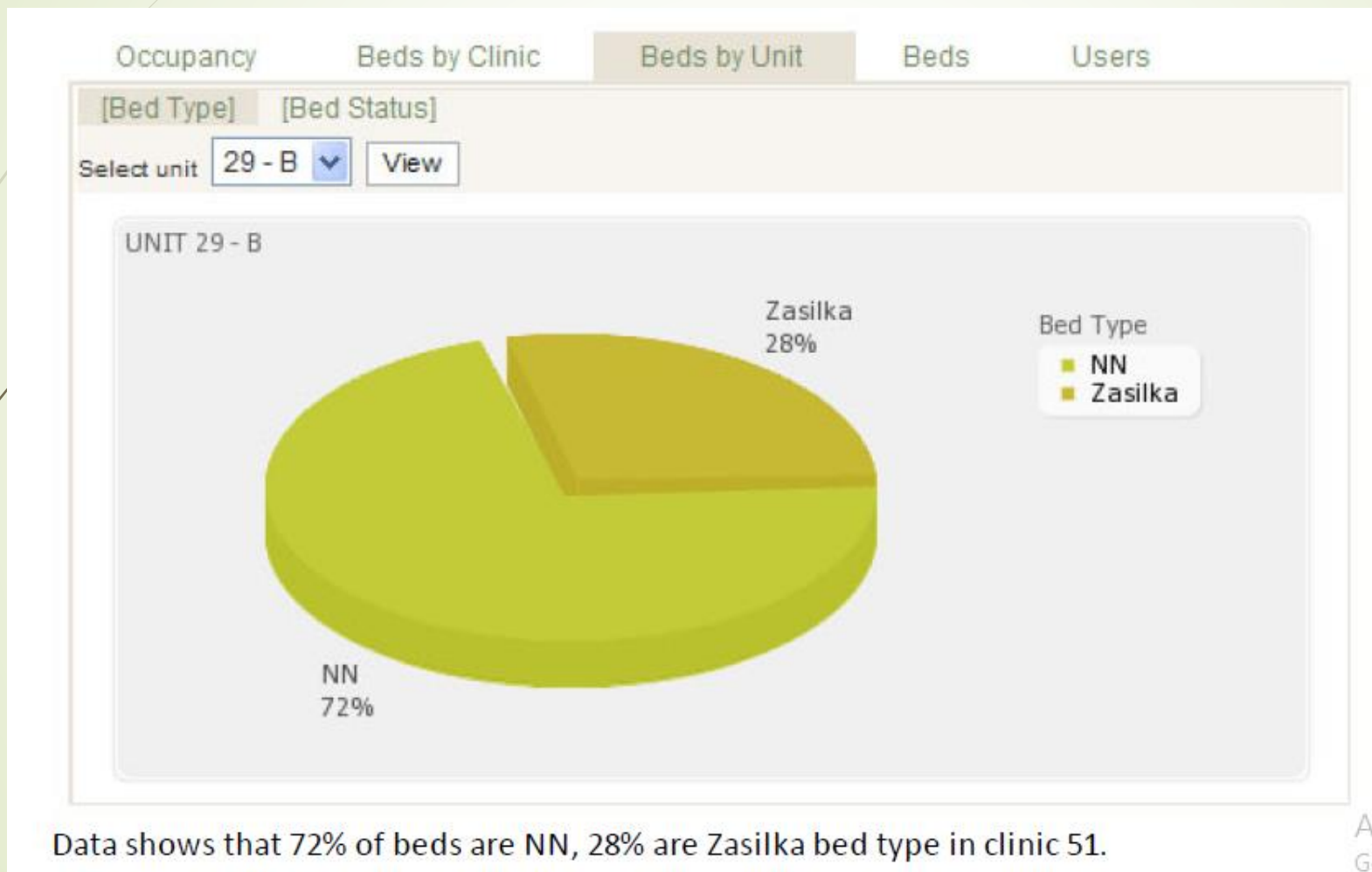
2.5.1.3.5 Bed type by unit

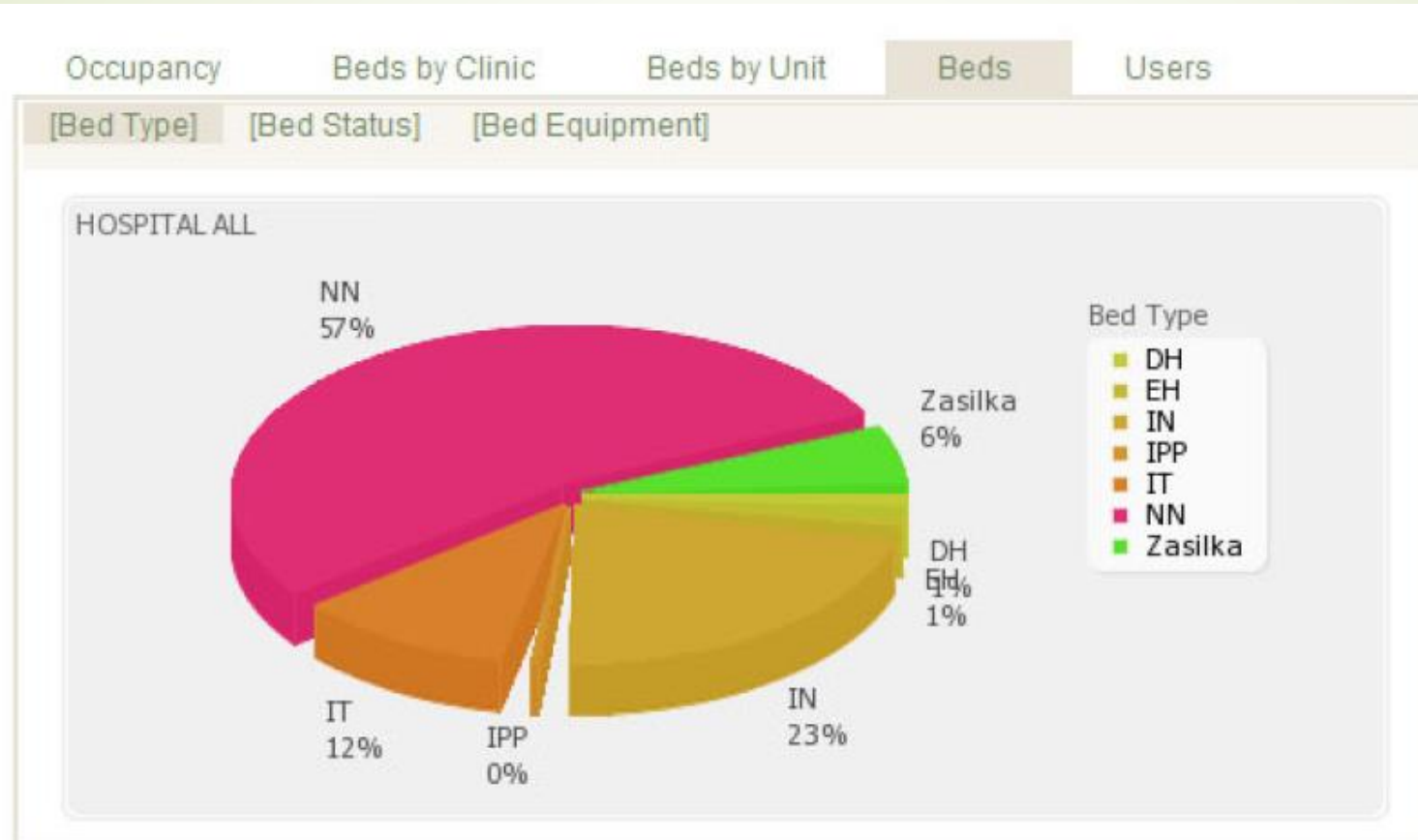


Bed Type by Units displays total number for each bed type in each unit as a bar chart.

Activate W







For each bed type there is a percentage of beds with that bed type at the level of entire hospital.



For each bed status there is a percentage of beds with that bed status at the level of entire hospital.

2.5.1.3.8 Bed equipment at hospital



For each bed equipment there is a percentage of beds using that equipment at the level of entire hospital.

Go to

Design of Hospital Beds Center Management Information System based on HIS

Lu Ren¹, Xiaofei Zhang¹, Jingxia Wang¹, Mei Sun¹, Siyuan Tang^{1,a,*}, Ni Gong^{2,b,*}

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²The Third Xiangya Hospital, Central South University, Changsha, China

a. renlu818@126.com, b. 1805278220@qq.com

*corresponding author

Keywords: Hospital Management, HIS, Bed Management

Abstract: Hospital information system(HIS) has been considered as one of the most important branch of the Medical Informatics by international academia community, with the essence of integrating all the hospital departments into a large information network to make the make the whole hospital system run better. Aiming at "difficult to be hospitalized" issues in our country, our research has designed and realized a set of safe, stable and easy-to-handle beds resource management information system according to this article HIS functional specifications. The Bed Management Information System was developed by the hospital information department, using PowerBuilder, the MVC model and the Oracle database to make the system run normally. This system has realized the bed resource management of hospitalized patients, and achieve interdisciplinary treatment for different department according to the system information, which reduce the average hospitalized stay of patients effectively.

3.1. The overall requirement analysis

It is important to establish a normative, safe and stable, simple bed resource management system based on the demand of patients, users and leaderships in hospital. The overall requirement analysis was showed in figure 1.

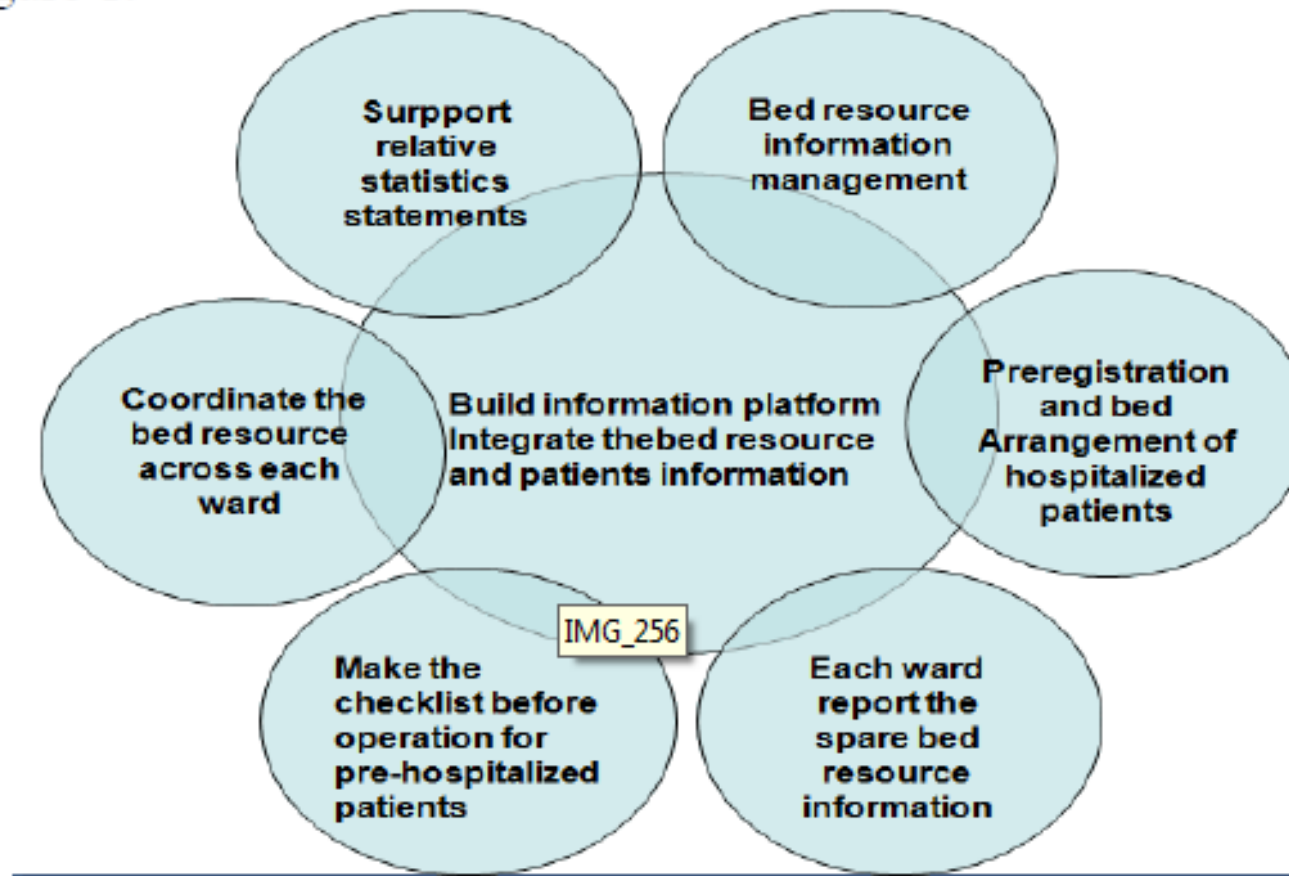


Figure 1: Beds Center Management Information System overall requirement analysis.

3.2. The functional requirement analysis

The functional requirement analysis including the following 5 aspects:

- 1) Bed appointment management;
- 2) Bed report management;
- 3) The overall bed list in department;
- 4) Appointment and transfer between different department;
- 5) System settings.

3.3. The non-functional requirement analysis

The non-functional requirement analysis can be divided into 4 aspects:

- 1) Accuracy and timeliness in system processing
- 2) Safety of system
- 3) Scalability of system

The functional requirement analysis

The functional requirement analysis including the following 5 aspects:

- 1) Bed appointment management;
- 2) Bed report management;
- 3) The overall bed list in department;
- 4) Appointment and transfer between different department;
- 5) System settings.

The non-functional requirement analysis

The non-functional requirement analysis can divided into 4 aspects:

- 1) Accuracy and timeliness in system processing
- 2) Safety of system
- 3) Scalability of system
- 4) Maintainability of system

System Module Implementation

5.1. Bed reservation management module implementation

- 1) Reserved record;
- 2) Scheduled record;
- 3) Canceled Records;
- 4) Hospitalized Records.

5.2. Bed report management

5.3. List of bed in ward

- 1) The whole bed information of hospital;
- 2) The emergency bed list.

5.4. Appointment transfer branch management

Information Systems for Supporting Operational Management of Hospital Beds in the NHS

N.C. Proudlove and R. Boaden

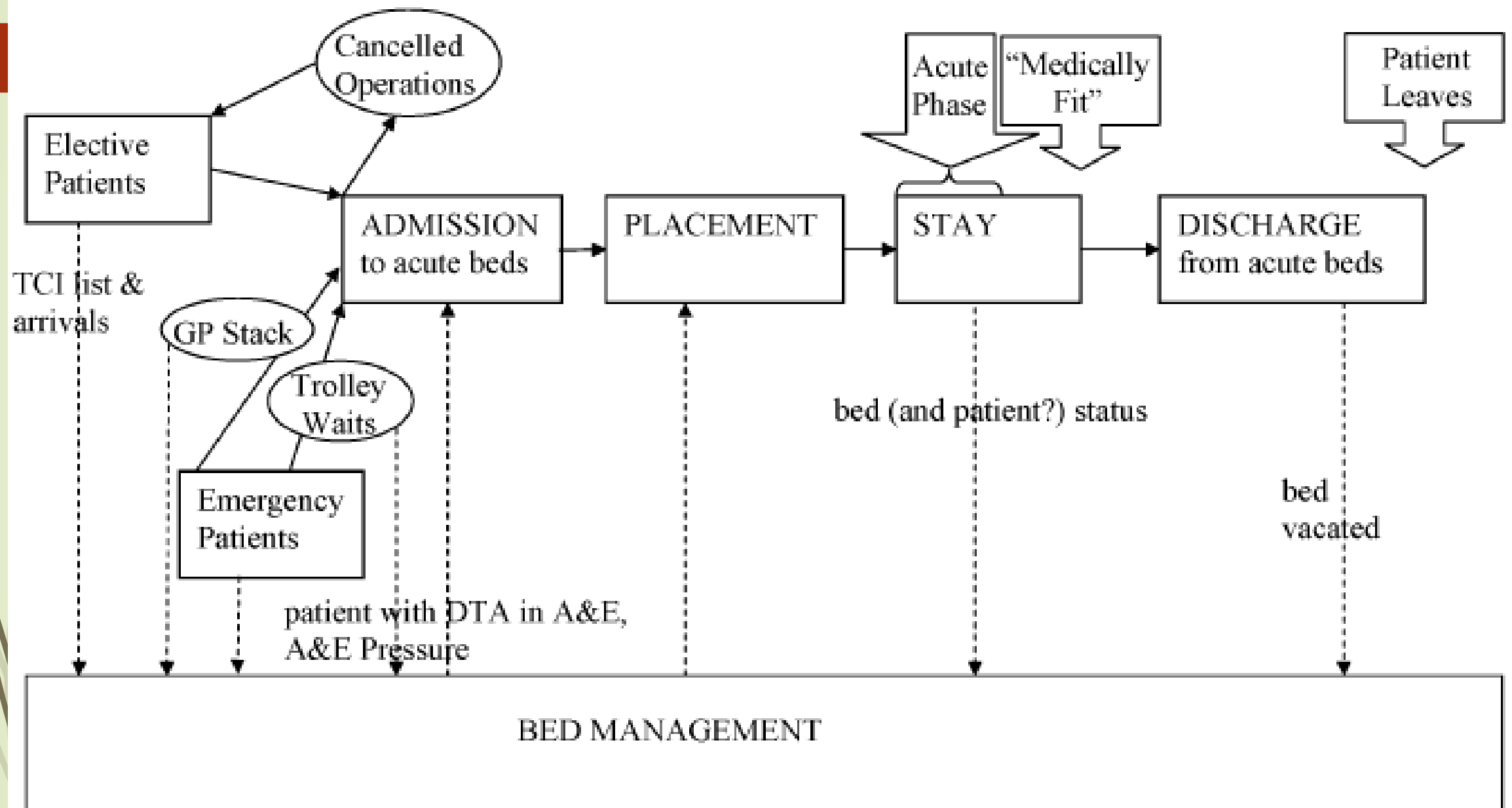
Abstract

This paper provides an analysis of information systems (IS) currently used in UK hospitals to support the effective management and utilisation of beds. It focuses particularly on IS working at the level of individual patients (particularly in real-time), rather than aggregate planning tools. It locates these systems within the broader context of the National Programme for IT (NPfIT) and concludes that such systems will continue to have an important place in improving bed utilisation while the NPfIT is being rolled out, and in some cases could contribute useful implementation experience and algorithms.



In summary, problems identified in the use of information for BM are:

- paper-based information collection and processing
 - time and effort required to obtain information
 - timeliness of information
 - coordination of resources required by competing admission streams
 - active management of patient care and discharge.
- 



*Description**Aim***Data collation**

Provide electronic updating and archiving (for analysis). Existing paper-based proformas are still used on BM ward walks and the data transferred to database. The database is updated around four or five times a day, with minor updates following phone calls.

Data transmission

Reduce the time and effort required to collect bed status information.

At set times the wards are required to enter the same sort of information as previously collected by BM ward walks.

The database is updated around four or five times a day, with minor updates following phone calls.

Real-time data
transmission

Improve the timeliness and accuracy of bed status information, and enable the rapid location of patients.
Real-time bed states maintained through ward entry of patient movement at or soon after it occurs.

Resource planning

Coordinate and book the key constrained resources across the hospital (enterprise).

Patient care and/or
discharge
management

Plan and monitor the management of care and/or the progress towards discharge.
Maintain focus of care/discharge package providers whilst dealing with many patients.

پیوست ۲- وضعیت تخت

سیستم کدگذاری: thritaEHR bedStatus

کد	نام اصطلاح
۱	اشغال شده
۲	آماده پذیرش
۳	خارج از سرویس دهی ^۱
۶	رزرو شده
۷	در حال انتقال ^۲
۸	در حال ترخیص ^۳
۹	بازگشت از ترخیص



وزارت بهداشت، درمان و آموزش پزشکی
دفتر آمار و فناوری اطلاعات

راهنمای تبادل داده‌های مدیریت تخت‌های بیمارستانی

نگارش 2.9



داده پیام مدیریت تخت‌های بیمارستانی

کلاس اصلی که برای ثبت داده‌ای مدیریت تخت مورد استفاده قرار می‌گیرد، کلاس `NationalHospitalStatusVO` می‌باشد. اqlام داده‌ای سیستم مدیریت تخت شامل داده‌های مربوط به موجودیت تخت می‌باشد.

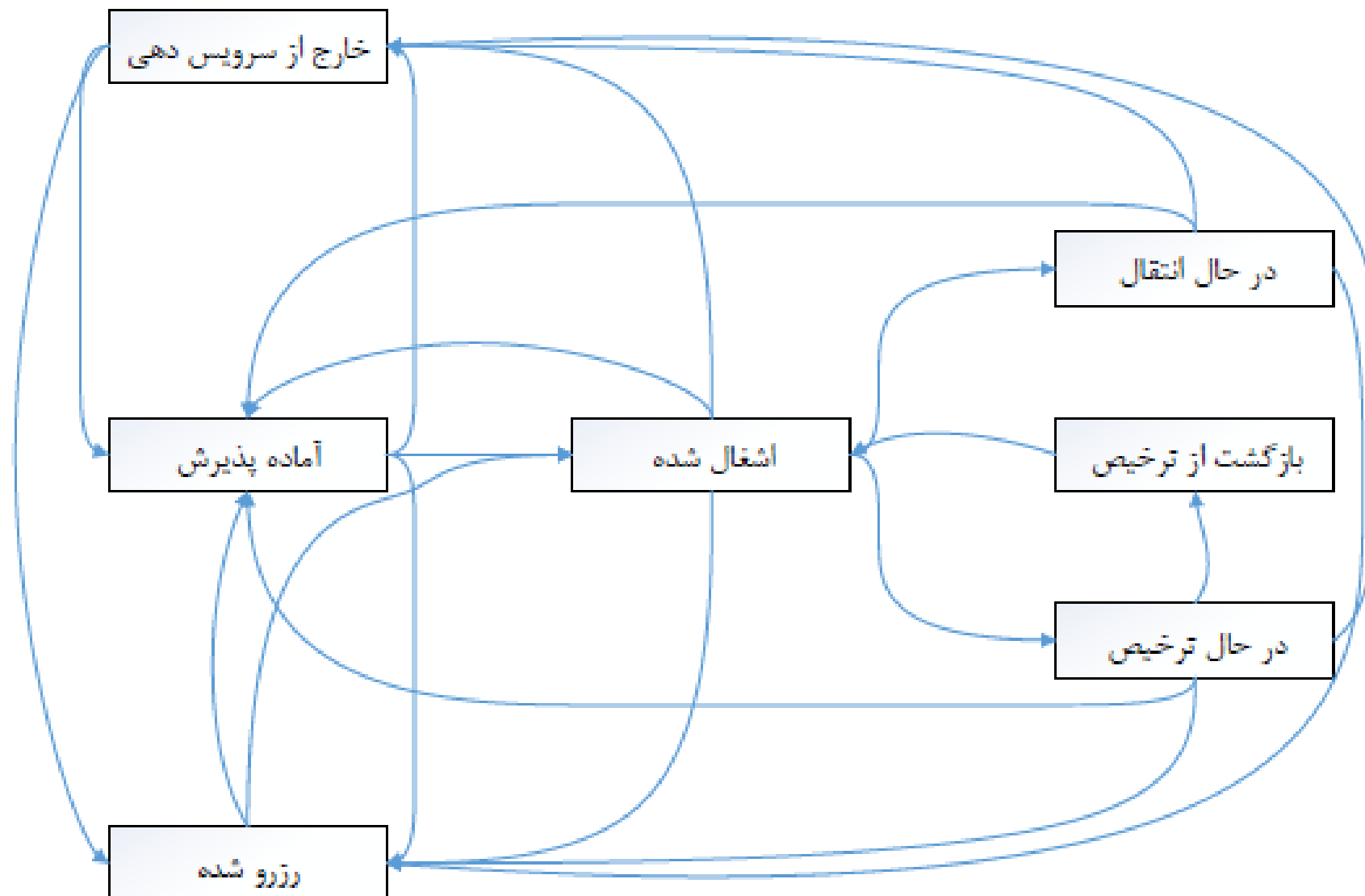
این کلاس حاوی ویژگی‌هایی^۱ است که اqlام اسناد بیمارستانی را تشکیل می‌دهد. این کلاس با استفاده از فراخوانی وب سرویس و با تغییر وضعیت تخت در بیمارستان، انتقال فعال اطلاعات به سپاس انجام می‌گیرد.

توضیح هر یک از کلاس‌ها در جدول‌های جداگانه، به همراه الگوی داده و نحوه ارتباطات آن در ادامه آمده‌است.

هر یک از اqlام اطلاعاتی، بنا بر ماهیت آن ویژگی، قابلیت پذیرش یک یا چند نمونه از آن ویژگی را داراست. به عنوان مثال: در فیلد نام بیمار فقط امکان ثبت یک نام وجود دارد، اما در فیلدی مانند سازمان‌های بیمه‌گر، فرد می‌تواند یک یا چند بیمه داشته باشد.

همچنین، ثبت برخی از ویژگی‌ها، مانند نوع پذیرش و یا تاریخ ترخیص بیمار اجباری و ثبت برخی موارد، مانند نام مادر بیمار اختیاری است.

با توجه به موارد مذکور، براساس استاندارد UML^۲، هر یک از اqlام اطلاعاتی دارای نحوه ارتباطات مشخصی می‌باشند. نحوه ارتباطات براساس استاندارد فوق، در جدول خلاصه شده است و در قسمت‌های مختلف این دستورالعمل از آن استفاده شده است.



شکل ۱۰- نمودار گردش حالت‌های مختلف تخت و تغییر آن‌ها

راهنمای تبادل داده‌های مدیریت تخت‌های بیمارستانی - نگارش 2.9

تغییر وضعیت‌های امکان پذیر تخت

حالت تخت	حالت‌های امکان پذیر بعدی
اشغال شده	در حال انتقال در حال ترخیص آماده پذیرش رزرو شده خارج از سرویس دهی
آماده پذیرش	اشغال شده رزرو شده خارج از سرویس دهی
خارج از سرویس دهی	آماده پذیرش رزرو شده
رزرو شده	آماده پذیرش اشغال شده
در حال انتقال	آماده پذیرش رزرو شده خارج از سرویس دهی
در حال ترخیص	آماده پذیرش رزرو شده خارج از سرویس دهی بازگشت از ترخیص
بازگشت از ترخیص	اشغال شده

نام بخش	کد	توضیحات
جنرال	000	*در بیمارستان‌هایی که تنها یک بخش دارند و در همان بخش بیماران داخلی و جراحی به طور مشترک بستری می‌شوند، از این کد استفاده می‌شود.
جنرال VIP	010	بخش‌های vip که بیماران داخلی و جراحی به طور مشترک بستری می‌شوند *برای همه مواردی که تخت‌های داخلی در کنار تخت‌های جراحی، در یک بخش تعریف شده‌اند، از این بخش استفاده می‌شود.
داخلی VIP	012	بخش‌های vip که تنها بیماران داخلی بستری می‌شوند
جراحی VIP	014	بخش‌های vip که تنها بیماران جراحی بستری می‌شوند
مراقبت‌های ویژه جنرال	020	
مراقبت‌های ویژه جنرال و بعد از مراقبت‌های ویژه	021	
مراقبت‌های ویژه جراحی	022	
مراقبت‌های ویژه داخلی	023	
مراقبت‌های ویژه جراحی اعصاب	024	
مراقبت‌های ویژه کودکان	026	PICU
بعد از مراقبت‌های ویژه	028	Post ICU
مراقبت‌های ویژه نوزادان	030	NICU
مراقبت‌های ویژه جراحی قلب باز بزرگسالان	032	ICU-OH
مراقبت‌های ویژه جراحی قلب باز اطفال	034	
مراقبت ویژه جراحی قلب باز اطفال و بزرگسالان	035	
مراقبت‌های ویژه قلبی	036	CCU
بعد از مراقبت‌های ویژه قلبی	038	Post CCU

ویژگی	نوع داده	توضیحات	ارتباطات
BedChangeTime	DateTime	تاریخ و ساعت تغییر وضعیت تخت	۱-۱
BedNumber	String	شماره تخت در بیمارستان	۱-۱
BedType	DO_CODED_TEXT	این ویژگی معرف نوع تخت می باشد. در پیوست ۱ این کدها مشخص شده است.	۱-۱
BedStatusChange	DO_CODED_TEXT	نوع تغییر وضعیت تخت را نشان می دهد. در پیوست ۲ کدها مشخص شده است.	۱-۱
BedUniqID	DO_IDENTIFIER	این ویژگی نشان دهنده کد ملی تخت مذکور می باشد. شناسه مذکور در کل کشور واحد می باشد.	۱-۱
Hospital	DO_IDENTIFIER	شناسه بیمارستان که توسط وزارت بهداشت به آن بیمارستان اختصاص داده شده است.	۱-۱

ویژگی	نوع داده	توضیحات	ارتباطات
MedicalRecordNumber	String	شماره پرونده پزشکی بیمار است. منظور از شماره پرونده، شماره منحصر به فرد بیمار در مراجعه فعلی می باشد و این شماره در مراجعات آتی بیمار تغییر خواهد کرد.	۰-۱
NationalCode	String	کد ملی ۱۰ رقمی بیمار	۰-۱
Room	String	این مشخصه نمایانگر شماره یا نام اتاقی است که تخت در آن قرار دارد.	1-1
System	DO_IDENTIFIER	شناسه سیستم نرم افزاری	1-1
WardName	String	نام بخشی که تخت در آن قرار دارد. مثلاً اگر تخت در بخش «پوست ۱» قرار دارد، در ویژگی «WardType» نوع آن بخش یعنی «پوست» بر اساس سیستم کدگذاری ذکر شده ثبت می شود و در این ویژگی (wardName) شماره «۱» قرار می گیرد.	۰-۱
WardType	DO_CODED_TEXT	نوع بخشی که تخت در آن قرار گرفته است. کدهای مربوط به بخش های مختلف موجود در مراکز ارائه خدمات سلامت در جدول موجود در پیوست ۳ آمده است.	1-1



Thank for your attention

I hope enjoyed from our journey

The End

