Mitigate Patient Falls within the Acuity Adaptable Units

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FAIL FAST, LEARN FAST
This study uses the power of Participatory Design (PD) process to involve stakeholders within the hospital through the design process. Participatory design uses qualitative research methods, such as surveys, interviews with stakeholders, prompt cards, and observations, to gain a better understanding of patients’ experiences. It also uncovers new ways of helping patients feel safe and comfortable during their stay in a hospital. The goal of this research is to identify the antecedents, consequences, and determine interventions that can mitigate patient falls in Eskenazi Hospital’s acuity adaptable units.
How might **PARTICIPATORY DESIGN (PD)** involve stakeholders in the design process to **mitigate patient falls** within the **acuity adaptable units**?

**How** might we involve stakeholders in data collection and fact finding?

**How** to define the problem after data collection and fact-finding steps?

**How** to involve stakeholders in the ideation session?

**How** to evaluate ideas?
Falls are one of those topics that are pertinent to almost every hospital, and one that most hospitals are seeking to work on actively.1

According to the Agency for Healthcare Research and Quality (AHRQ), between 700,000 and 1 million patient falls occur within the healthcare environment annually. Fall results in severe injuries, deaths, and could end up very expensive for patients and hospitals. Patient falls are a serious issue in the United States and need consistent attention.2 In fact, a continuous process is required to keep patients safe from falls and to keep the health care physical environment safe.2 One of the aspects of this research is to identify the antecedents, consequences, and determine interventions that can mitigate patient falls in the healthcare environment, and the ultimate goal of this research is to generate a new process by merging the best aspects of participatory design and lean startup at the end of the action research.

Preventing patient falls during hospitalization has been a concern in the healthcare industry for many years, and it is the most commonly reported adverse event in hospitals.3 Statistics indicate that between 30% to 51% of falls result in severe injuries such as laceration, head injury or fracture and, many cases, death among elders over 65 years old.4 Besides the health risk for the patient, a patient fall could result in a very high cost for organizations. For example, the estimated cost for older people falls raised from $20.3 billion in 1994 and is estimated to reach $32.5 billion in 2020.5 Also, the Joint Commission reports that the average operational costs for a hospital-related fall injury is more than $13,000, and a patient’s length of stay increases by an average of 6.27 days which requires additional costs and resources.

Mortality rates due to falls have grown distinctly over the past decade because of the aging of the population, and it is going to become a big challenge for hospitals in the future. Therefore, most hospitals invested to prevent the patient falls within their environment to reduce the number of patient falls as well as expenses after falls.

This study is going to use the power of Participatory Design (PD) approach to involve stakeholders within the hospital through the problem and fact-finding, idea generating and prototyping the solution to efficiently mitigate patient falls in acuity adaptable units. The participatory design is being used in healthcare. It helps healthcare leaders to increase their patient and staff satisfaction in acuity adaptable units. The participatory design is being used in healthcare. It helps healthcare leaders to increase their patient and staff satisfaction in acuity adaptable units. The participatory design is being used in healthcare.

LITERATURE REVIEW
LITERATURE REVIEW

Physical Conditions such as lighting, floor material, medications and poor placement of handrails are some factors which increase the risk of patient falls within the physical environment.9

Hospitals are not able to prevent all patient falls, as a result most of the hospitals find it necessary to improve their service with the help of the newest technology to reduce the risk of such incidence. Fall incident has a direct relationship with a patient’s physiological environment and condition of the floor.10 When falls happen, we need to be concerned with three important aspects around the falls. First is the immediate and long-term cost. Second is the risk of fall recurrence and last are health and physical condition of the patient falling.

We can categorize falls into four types:11

- Accidental
- Anticipated physiological
- Unanticipated physiological
- Intentional

I. Accidental falls happen during a patient’s trip to the physical space by using an IV pole, falling out of bed when they need to reach something near their bed, and falling during their shower and at the end to the restroom.

II. Anticipated physiological is the most common type of patient falls. Falls happen to the patients who have risk factors that can be identified in advances such as high-risk medication, abnormal movements, dementia or urinary frequency.

III. Unanticipated physiological falls happen to the patients with the low chance of falls in general, but they are suffering from a fainting episode, stroke or seizures, which are unpredictable.

IV. Intentional falls are the result of the patient’s action. In some cases, patients intentionally drop or throw themselves to the floor for different reasons such as getting attention. They also sometimes falsely report they have fallen.

Among these four types, accidental and anticipated physiological are preventable while, the unanticipated physiological and intentional are not.12

Physical Environment

According to the American Institute of Architecture (AIA), the physical environment has a direct role in preventing patients falls within the healthcare environment. Physical environment - AIA also recommended standardizing all patients’ private rooms in all of the healthcare environments.

Current studies about the locations of falls indicate that the majority of falls occur in the patients’ rooms.13 Fall usually happen when patients are alone, and sometimes when they are trying to access to the bathroom, or within the bathroom. The position and height of the bed, quality of light and floor material are also some other factors within the environment. The physical environment has a direct impact on the patient, staff performance, and safety within the healthcare environment. Falls in healthcare units normally occur in places such as a patient’s private rooms, assisted living center, nursing home, rehabilitation unit, recovery unit, postpartum unit, delivery unit, labor unit, perioperative unit, and surgical units.14 The interrelationship between staff, the tools that they are using and the environment that they are working in is one of the interesting topics that can be discussed regarding patient falls.

Research studies showed that the percentage of patient falls reduced in patients’ rooms that had space to accommodate patients families because their families can assist them during their activities. Patient falls were reduced in patients’ rooms that had a direct visual access to the nurses’ station.15 This reason that direct visual access resulted in reduced patient falls was that nurses were able to monitor patients during their activity and could rapidly reach patients needing help. Since the literature supported that direct visual access and patient proximity to the nurses’ station helped reduce falls, nurses made an effort to place high fall risk patients near the nurse’s stations. Another study described patient transfers to and from the bed occurring in 42.% of inpatient falls, while in another study, a group of researchers analyzed one-year fall data (267 falls), found 38% percent of falls occurring during this time. They also found that 16% of 267 falls occurred during patient’s toileting.16 Overcrowding patients’ private room with computers, equipment, and furniture is another reason for patient.17

Medication

Medication is also another factor causing patient falls. Medication, for example, medicines prescribed for Oncology patients such as sedatives and benzodiazepine cause dizziness and weakness in patients and increase the fall risk. Most of the falls happen among the patients who did not call for help even when they instructed to ask for help and also to ones who do not seek assistance to use the bathroom.18
Patients fall prevention in hospital

Although there is no evidence to prove that patient falls can be prevented, according to the Institute for Healthcare Improvement, in 2012, there were six promising recommendations to reduce the risk of patient falls.

- Screening fall risk on admission screening
- Screen fall-related injury risk factors and history upon admission
- Assess risk of anticipated physiological falling and risk for serious injury from a fall
- Communicate and educate staff and patients about patients’ falls and injury risks
- Standardize interventions for patients at risk for falling
- Customize interventions for patients at highest risk of fall-related injury

The participatory design is one of the most promising processes to understand patients’ experiences. A creative process that leverage users’ empathy, idea generation, prototyping and testing to make sure their solutions work, unlike the Lean process that doesn’t take a great effort to understand patients’ experience before finding a solution. 19

The participatory design uses qualitative research methods, such as surveys, interviews with stakeholders, prompt card, and observations, to have a better understanding of patients’ experiences. The participatory design can address challenges in a variety of domains related to the patients’ experiences. It also uncovers new ways of helping patients to feel safe and comfortable during their stay in a hospital.

If the mission of hospitals’ leaders is to improve their patients’ experience. Participatory design is a powerful process to help them achieve their goal, as it requires leaders to have empathized with their patients, and be creative during their decision making.

Beside participatory design. Lean is another approach to solve challenges within the companies and organizations. The main idea of Lean is to increase user value by decreasing waste. In another word, Lean is a valuable process for optimizing by remove waste and add value to the healthcare. Lean is not only a tool to reduce cost, while Lean is a way of thinking and acting for entire organizations. 20 most of the industries, healthcare, and government using Lean approach to achieve their goals. Lean is a team-based approach and it involves all stakeholders during the process. Lean respects all organizations’ staff and will help them to pursue new opportunities to improve their workspace and helping them to generate ideas for continuous improvement.

During this study. Design team tries to find a solution for patient falls within the acute adaptability section at Eskenazi hospital, Indianapolis, IN. By using participatory design approach. Participatory design is a valuable approach to generate new ideas and solve the human’s wicked problems by involving users at the center of the process. The participatory design approach is great tools to use within the healthcare environment to improve hospital’s staff and patients quality. Patient falls have been one of the most common challenges within the hospitals for a long time, and it is still one of the challenges for hospitals. It shows using Lean alone could not solve patient falls because of the Lean nature and characteristic. Lean is an excellent approach to optimize products, but in order to solve the human’s problems, the participatory design is more efficient in comparison to the Lean.

Stakeholders Map

Stakeholder mapping is an approach to Stakeholder Engagement. Stakeholders map helps design team to understand who are the key stakeholders, where they come from, and what is their role in our patient falls challenge.


The patient room is one of the most important and complicated areas within the hospitals because of the direct impact on the patients and their families. On the other hand, it is important for those designing and working in the patient's room to understand the risks for patient falls in the patient's room. The patient's room can improve patients' wellbeing and their comfort, and it can also help the hospital to save money during construction by using proper resources and evidence-based design. The following bubble map indicates the complexity of the patient's room and the critical role that this environment plays within the hospitals.
Participatory Design

The field of Participatory Design (PD) has grown rapidly over the last 20 to 30 years. Participatory Design Born in Scandinavia in the mid-1960s under the moniker "cooperative design." What we now call participatory design went through many changes and can be seen changing healthcare organizations, community planning, urban design, and architecture, as well as product design, software design, and graphic design.

Participatory Design which these days often know as co-design is an approach to solving the wicked problems by actively involve all stakeholders such as employees, designers, users, researchers and sponsors into the design process. The participatory design also has some other benefits. It encourages designers to consider different point of view and build empathy. Because it is important for design researchers to hear all stakeholders opinion. As a result people feel a sense of ownership when they are actively involved in participatory design. It also helps design researchers collect some more facts about the challenges that they may not have been aware of.

Participatory design approach alone is not enough because design researchers need creative strategies to use during the process of designing. So by merging Design Thinking as a complementary approach design researchers can tackle challenges more efficiently.

Design thinking is another approach that can be used to find solutions to problems people and organizations face. Design thinking origins go back to the 1950s and 1960s, as more conversations started around developing a science out of the field of design to understand how design functions. IDEO is broadly known as one of the companies that brought design thinking to the mainstream. IDEO challenged the designers to think beyond omnipotent design and the focus on the product. They suggested designers be involved in the big picture of socially innovative design, design approach needs to be spread among participating stakeholders, and the ideas need to be prototyped and tested early in the design process.

IDEOArgues that design thinking is very similar to the old participatory design and tested early in the design process.

Strengths:
- Outputs are more efficient, effective, and safe.
- Assists in managing users' expectations and levels of satisfaction with the product.
- Users develop a sense of ownership for the product.
- Output require less redesign and integrate into the environment more quickly.
- The collaborative process generated more creative design solutions to problems.

Bellows are some strengths and weaknesses of the Participatory Design process:

- Participatory Design approach alone is not enough because design researchers need creative strategies to use during the process of designing.
- So by merging Design Thinking as a complementary approach design researchers can tackle challenges more efficiently.
- Design thinking is another approach that can be used to find solutions to problems people and organizations face. Design thinking origins go back to the 1950s and 1960s, as more conversations started around developing a science out of the field of design to understand how design functions.

Participatory Design and community empowerment to solve different problems within health care inequalities. Design thinking is commonly comprised of six stages of Understand, Observe, Point of view, ideate, Prototype, and test. Design thinking starts with a problem or challenge. The first stage of the process is empathetic understanding of the problem and the people whom you are trying to solve the problem for. Second stage interaction includes observing user behavior and interaction. Understanding and observing stages are crucial to the user-centered design process. It allows designers to gain insights about users and their needs. The third stage is Point of view, where designers become aware of people's needs and develop insight. The design problem/ challenge is defined at this stage. Ideate is about generating ideas, and the prototype stage includes producing and building some scaled down and inexpensive versions of the product or service. Finally, the ideas are tested at the Test stage.
Weaknesses

- It is more costly
- It takes more time
- May require the involvement of additional design team members (i.e. ethnographers, usability experts) and wide range of stakeholders.
- May be difficult to translate some types of data into design.
- The product may be too specific for more general use, thus not readily transferable to other clients; thus more costly

A Design Thinking Process was utilized for this research that was adapted from Min Basadur’s Simplex, a Flight to Creativity. This process includes eight phases: Problem Finding, Fact Finding, Problem Definition, Idea Finding, Evaluate and Select, Plan, Acceptance and action. These phases help to guide the methods to collect meaningful insights. The Simplex process emphasizes a collaborative and co-design approach to problem-solving. Each process step culminates in a process deliverable which is as follow,
solution is successfully implemented.

During last decade big organizations and companies who chose participatory design approach as their main approach to the wicked problems expanded rapidly. Each one of those organizations have their own specific design process, to help them during their creative co-design from problem finding to the implementation their solution. Below are some design thinking processes that some organizations designed and utilized during their design thinking process.

![Stanford D.School Design Thinking Process](image)

![Zurb Design Thinking Process](image)

![The Double Diamond Diagram Design Thinking Process](image)

![IBM Design Thinking Process](image)

![IDEO Design Thinking Process](image)

![The Google Design Sprint Process](image)

![Nielsen Norman Group Sprint Process](image)
Lean

The Lean was derived from the Japanese manufacturing industry, Toyota, in the 1990s to optimize production processes. The Lean approach is about achieving more by minimizing waste in every area of production, increasing the productivity, reducing the cost and manufacturing lead time and getting the correct output in the first pass, are some of the most important factors that motivate companies to apply lean manufacturing. At its core, the lean approach focuses on adding more value to customers by improving processes and eliminating waste and inefficiencies. Lean principles were also transferred in areas such as management, and product design and development and non-manufacturing contexts such as construction and healthcare.

Implementing Lean manufacturing properly will lead to cost reduction, inventory level reduction, improvement in inventory turns, reduction in delivery lead time, decreasing response time to customers, better material flow and higher utilization of investment. Only 10% of the companies could successfully implement Lean. Repeatable and consistent methodology for implementation is required for Lean success. There are several obstacles to implementing lean successfully. Lack of focus on human capital, inconsistency in the performance of people and machines, and lack of employees’ collaboration because the fear of losing their jobs are some of the reasons that Lean does not succeed in organizations.

Implementing Lean is also time-consuming and may disrupt the organizational framework. Another critical reason that prevents organizations from successful Lean implementation is the absence of a clear definition and roadmap for the process and lack of leadership commitment. In summary, Lean is a slow process, and once an organization commits to the process, they should continue until they see some results. Lean design covers three perspectives which are transformation, flow and value. Transformation is about turning input to output and solving the problem. Flow perspective focuses on eliminating waste, reduction of rework, and rapid feedback. The value emphasizes on the use of analysis to deliver what matters the most to the customer.

Healthcare’s are changing, and their financial challenges lead them to change their operating system and to invest more in environment infrastructure. Therefore, integrated facility design (IFD) or Lean design which was defined with some organizations, can help healthcare through this transformation by reducing waste and cost at the beginning of the process. The seven primary wastes within healthcare are listed as below:

- The waste of Overproduction
  Overproduction means making more than the customer requires or pushing product to the next downstream customer too soon. It can also be product or information waiting for the next step in the process.

- The waste of Over-Processing
  Over processing is waste within the process itself, for example, we might use equipment or software that isn’t adequate such as using Excel for a database or using a piece of equipment that is designed for large batches when we are trying to implement one-piece flow.

- The waste of Transporting
  Transportation is moving product or information. When we move material or information, it does not become more valuable. Thus it is a waste.

- The waste of Waiting
  Waiting can be the waste of people waiting for things like information or material, or it can be product or information waiting for the next step in the process.

- The waste of Motion
  Motion waste is a people waste. People are often walking around to find information supplies or tools which adds no value.

- The waste of Inventory
  Inventory or storage is the storage of product or information. Storing products or information that does not add value for the customers and it costs money.

- The waste of Defects
  Defects can be products that are defective or information that is inaccurate or missing.

- The waste of Stash
  Stash waste is the storage of product or information. Storing products or information that does not become more valuable. Thus it is a waste.

- The waste of Transportation
  Transportation is moving product or information. When we move material or information, it does not become more valuable. Thus it is a waste.
Where does IFD apply within the healthcare

- New hospital design
- Hospital master planning
- Hospital renovation
- Department layout improvement
- Integrated project delivery

The Lean approach is also an example of using Lean principles for developing businesses and products. The Lean usually starts with a hypothesis around a problem and solution. It is then followed by an iterative process of building, measuring and learning. The primary goal of the Lean startup is to form a continuous feedback loop with customers during the product development process. Below are some strengths and weaknesses of the lean process:

Strengths:
- Financial benefits
- Strategic benefits
- People development
- Customer benefits
- Competitive position
- Stakeholder benefits
- Standardization benefits

Weaknesses
- Lack of Strategic Focus
- Lack of Proper IT Systems
- The Time Factor
- The Human Factor
- Harnessing Lean Manufacturing for Success
With multiple disciplines around a table, it’s possible to bring new perspectives to a problem within a structured framework for working TOGETHER.

Perez agrees:
Participatory Design vs. Lean

Whereas, in Lean approach the primary focus is on the problem and refining the solution, design thinking sees problem and solution both like things that need to be explored. Therefore, a significant emphasis in design thinking process is in understanding, observing and defining the problem. Therefore, a significant emphasis in design thinking process is in understanding, observing and defining the problem.

Mueller, R and K Thoring (2010) provided an extensive analysis and comparison of the two approaches of Lean and participatory design. As they argued, both approaches are innovation focused, have user-centered design and include rapid iteration. Supporting the Lindberg study, Mueller and Thoring also emphasized on user research at the beginning of the process as the core in design thinking, compared to the Lean approach which is that the role of qualitative research is not as elaborate. They also explain synthesis as another difference between the Lean and design thinking approach. They claimed that the participatory design approach includes more sophisticated methods for synthesizing insights from the user research, such as persona and journey maps. Mueller, R and K Thoring suggested a combination of Participatory Design and Lean process, to apply the most promising aspects of both strategies.

Comparison of important aspects of Participatory Design and Lean

<table>
<thead>
<tr>
<th>What</th>
<th>Participatory Design</th>
<th>Lean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Innovations</td>
<td>Innovations</td>
</tr>
<tr>
<td>Scope, Focus</td>
<td>General innovations</td>
<td>High-tech innovations for Startups</td>
</tr>
<tr>
<td>Approach</td>
<td>User-centered</td>
<td>Customer-oriented</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Solve wicked problems</td>
<td>Unclear customer problem</td>
</tr>
<tr>
<td>Testing</td>
<td>Fail early to succeed sooner</td>
<td>Pivoting is at the heart of the ‘fail fast’ concept. The sooner you realize a hypothesis is wrong, the faster you can update it and retest it.</td>
</tr>
<tr>
<td>Iteration</td>
<td>Yes (&quot;Iteration&quot;)</td>
<td>Yes (&quot;Pivoting&quot;)</td>
</tr>
<tr>
<td>Ideation</td>
<td>Ideation is part of the process, solutions are generated in the process</td>
<td>Ideation is not part of the process, product vision is initially provided by company founders</td>
</tr>
<tr>
<td>Qualitative Methods</td>
<td>Strong focus: elaborated ethnographic methods, user research, observations, etc.</td>
<td>Not a focus</td>
</tr>
<tr>
<td>Quantitative Methods</td>
<td>Not a focus</td>
<td>Strong focus: metric-based analysis; provides matrices, and testing</td>
</tr>
<tr>
<td>Business Model</td>
<td>Not a focus</td>
<td>Focus</td>
</tr>
<tr>
<td>Adaption of deployments</td>
<td>Not a focus</td>
<td>Five Whys Method</td>
</tr>
<tr>
<td>Typical Methods</td>
<td>Shadowing, Qualitative Interview, Paper Prototyping, Brainstorming (with specific rules), Synthesis, etc.</td>
<td>Qualitative Interview, Smoke Test, Paper Prototyping, Innovative Accounting, Split (A/B) Tests, Cohort Analysis, Funnel Metrics, Business Model Canvas, Five Whys, etc.</td>
</tr>
<tr>
<td>Hypothesis Testing</td>
<td>Not a focus</td>
<td>Focus</td>
</tr>
<tr>
<td>Prototype Testing</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rapid Iteration</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Target Group</td>
<td>Users (usually end users, sometimes other stakeholders)</td>
<td>Customers (distinguished between Users, Influencers, Recommenders, Economic Buyers, Decision Makers)</td>
</tr>
</tbody>
</table>
The following diagram indicates two main differences between the participatory design and lean startup approaches. At the beginning of the participatory design approach, participatory design is combining empathy of the context of a problem, unlike the Lean process does not have in-depth investigation during the problem and fact-finding. The participatory design also uses creativity to generate the insight and solution. Iteration is another difference between participatory design and lean startup. We can see iteration during all the steps of participatory design, but lean startup does not have iteration among all the steps.

**Lean Process**

The Lean concept was started by Eric Ries. It includes four stages of customer discovery, customer validation, customer creation, and company building. Customer Discovery is about finding the target users and market segment. Customer validation refers to validating if the product solves a problem for the target users. Minimal Viable Product (MVP) is usually used at this stage as the minimal set of features that can solve a problem. MVP could be a website landing page or a paper prototype. Customer creation is about finding if people want the product and are willing to pay for that. The market size is also investigated at this phase to see if it is large enough for a viable business. Finally, company building consists of defining processes and building a repeatable sales and marketing roadmap to scale the business.
Participatory Design Approach

Compared to lean startup process, design thinking process does not start with an idea, but with a problem or a question, instead. The ideas are usually created within the process. There is an extensive emphasis on the research to understand users first. Design thinking applies variety of research methods from other disciplines such as ethnographic methods and other qualitative methodology. Research is used to identify a problem and subsequently developing a solution in the ‘ideation’ step. The selected ideas are then built to test and gather feedback.
Eskenazi Hospital:

The Sidney & Lois Eskenazi Hospital is located in Indianapolis, Indiana and is the oldest and largest public healthcare system in Indiana. The main hospital campus included the Myers Building (Intensive Care, Labor and Delivery, OB/GYN, Surgery, and General Medicine Wards) as well as other buildings housing the Level I Trauma Center, Level I Burn Unit, Psychiatric Care, Prisoner Care, Outpatient Surgery, Therapy, Long Term Care, and various clinics.  

Eskenazi hospital have chosen as my context because it is the main hospital campus includes one of my committee members works there, and she supported my project, she also helped me to have access to resources, such as future participants. Choosing Eskenazi hospital helps me to have access to my stakeholders, patients, nurses, and physicians. Eskenazi hospital also is close to IUPUI university, and I have easy access to my context. All these factors will help me to save time and have easy access to my resources during action research.

The action research was conducted within the Acuity Adaptable Unites (AAU) at Eskenazi Health. Acuity Adaptable Units are rooms with a treatment model that allows all stages of patient care to come to the patient’s unit from the time of admission to discharge. AAU located in levels 8,9 and 10. In each floor we have four nursing stations and each nursing station covers twelve patient’s room, total 48 beds on each floor and 144 beds at AAU.

"HISTORY. ESKENAZI HEALTH. http://www. eskenazihealth.edu/aboUT/history."
Each nurse takes care of 4 patients, and as a result, we have three nurses in each nursing station. The following picture indicates one nursing station section.
**Design Approach**

In this research, participatory design approach was used to involve stakeholders in the design process. Engagement tools and methods were used to involve stakeholders in idea generation and prototyping. Participatory design is an effective approach to wicked human problems, and the output is efficient and effective. It also helps users develop a sense of ownership for the final solution. The solution is desirable for users, viable and feasible and can be integrated into the context easier and faster.

**Design Process**

The simplex process by Basadur was used during this research to involve stakeholders through the design process. Using the simplex process helped users have a clear understanding of each activity within each step of the design process. Problem finding and fact-finding under Generating step, problem definition and idea finding under conceptualizing step, evaluating and planning under optimizing, and finally acceptance and action under the implementing step. Following pages explain more details for different activities in each step.

During Problem finding and fact-finding different methods including Interview, sort cards and observation were used to elicit information from stakeholders. A checklist was designed to follow step by step to explain the process to our participants including purpose of the study and the consent form.

Two managers, one Resource Nurse, one Shift Coordinator, one Physical Therapist, one Care Technician, one Nurse Educator, one Occupational Therapist, two nurses, two patients with risk of fall and their families were involved in the research process.
Data Collection

Based on the data collected between years 2015 and 2017, 60% of patients in AAU had experienced fall during their activities in their room. Falls happened during their journey from their bed to the bathroom or vice-versa, and their movement in the room to have access to their belonging. 20% of patients had experienced fall within the bathroom. 20% of patients experienced fall when they wanted to get up from their bed or need to have access to their belongings close to their bed. 5% of patients had experienced fall while getting up from their bed. There are also some intentional falls which are less than 1%. Most of the falls happened between 8:00 am to 6:00 pm.

The Patient's Journey Map

A user journey map is a visualization of the experiences people have when interacting with a product or service so that each moment can be individually evaluated and improved.

The following patient’s journey map shows the overall view of patient’s journey within the healthcare environment. Hospitalization touch point indicates types of the room that patient might stay during her/his hospitalization. The falls touch point shows the different types of falls and important reasons of patients falls with these environments. This journey map helps participants during the action research to have a better understanding of the patient’s journey within the healthcare environment and to help them find the gaps to move forward for ideas and solution finding.

Based on the collected data the patient’s journey map was designed to show the patients’ touch points from admission to discharge. The focus of this study was on inpatients, during patients hospitalization at the AAU.

Nurses used John Hopkins fall risk assessment and researched patients’ risk of fall after getting transferred to the AAU.

Falls happen while patients:
- Attempt to get up from their bed
- Move in their room
- Use the bathroom and take a shower

Based on the research, patients mostly experience fall during their activities in their room and when they use bathroom. Only 20% of falls happen while they are getting up from their bed. However, previous research has been focused on patients getting up from their bed to prevent falls. If nurses can take care of patients while getting up from the bed, they can reduce falls during other stages tremendously.

During this research, participants identified based on their interaction with patients. Here are the stakeholders who spend most of their time with patients and have direct interaction with patients. Physician, managers, shift coordinator, nursing educators, registered nurses, physical therapist and care technician, staff and patients’ family.

Stakeholders map
PREVENT PATIENT FALL IN THE PATIENT’S ROOM

In the Bathroom
Walking in the Room
Getting Up

Define Patients with Risk of Fall
Falls Precaution

Touch Points
Stakeholders Involvement
Nursing Educator
Care Technician
Physical Therapist
Shift Coordinator
Managers
Physician
Patient’s Family
Staff
Registered Nurse
Hospital

Johns Hopkins
Fall Risk Assessment

MITIGATE PATIENT FALLS

Check In
Physician Medical Examination

In Patients Hospitalization in Acuity Adaptable Units
Out Patients
Acuity Adaptable Intermediate Intensive Care Unit (IICU)

PREVENT PATIENT FALL IN THE PATIENT’S ROOM

In the Bathroom
Walking in the Room
Getting Up

Define Patients with Risk of Fall
Falls Precaution

Touch Points
Stakeholders Involvement
Nursing Educator
Care Technician
Physical Therapist
Shift Coordinator
Managers
Physician
Patient’s Family
Staff
Registered Nurse
Hospital

Johns Hopkins
Fall Risk Assessment

MITIGATE PATIENT FALLS

Check In
Physician Medical Examination

In Patients Hospitalization in Acuity Adaptable Units
Out Patients
Acuity Adaptable Intermediate Intensive Care Unit (IICU)
Interview:

Interviews with stakeholders such as patients and families, hospital administrators, physicians and surgeons, nurses, staff, the architect, the general contractor allow stakeholders to share their experiences in the specific context and environment. Interviews help us with the first steps of design research. By conducting one on one interviews, design researcher can find out more about interviewee characteristics, emotions, experiences and their personality to improve their environment, make them satisfied and give them a better experience.

The main purpose of the interview was to identify reasons and challenges within the hospital that cause patient to fall. During the interview, participants were divided into two groups of patient’s family managers and nurses/healthcare providers. Different set of questions were designed for each group. Following are some of the questions that were asked during the interviews.

Interview with one of the nurses

- Are you worried about falling? Why?
- During which activities in your room, do you need an assistant to prevent falls?
- Explain to me concerns you have about falling.
- Explain to me how the hospital staff can prevent you from falling.
- How could you prevent falling?
- How could physical environment at acuity adaptable units, prevent you from falling?
- How could your room layout prevent you from falling?
- Is there anything else that you want to tell me about the incidence of patient falls?

Interview with one of the nurses

- Could you please introduce yourself.
- What is your role at acuity adaptable unit?
- How long have you been in this role?
- In what other hospitals or other setting have you worked before?
- Why do you think patients are falling?
- How often do falls occur on the acuity adaptable units?
- How do you prevent patient falls from occurring?
- What are your challenges or barriers in preventing falls?
- Explain how patient falls impact your current role.
- How do you take care of patients who are at high fall risk?
- Describe physical environment changes in acuity adaptable units that may prevent falls.
- Describe how a patient’s room layout could prevent falls.
- Is there anything else that you want to tell me about the incidence of patient falls?
Card Sorting:

Card sorting can quickly engage users in the content by visually activating their prior knowledge of various pre-determined topics—in this case, functional needs. When using prompt cards, interviewees determine which functional needs are most important to them through a variety of activities that involve sorting the cards into categories denoting importance.

During this activity, all participants were asked to prioritize 12 cards, which were designed based on the fall risk factors. A board was designed for the cards and participants were asked to prioritize cards on the boards.

Floor Plan:

One of the questions of the interview was describing the floor plan to reduce patients fall in future. However, this question was confusing for them. Therefore, we used the current floor plan and added all the furniture separately to the plan. Participants were to rearrange the furniture on the floor plan to prevent patients fall in future.
Observations:

Observations help researchers understand the user context and experiences at an even deeper level, allowing them to observe not just what people say they do, but what they do because these can be two different things. Observations allow for the researchers to uncover nuances in the user experience that a user may not think to explain, unlocking more profound, and more useful, insights. POEMS stands for People, Objects, Environments, Messages, and Services. This method provides a simple framework for quick and surprisingly deep user observation.

In this activity, nurses’ interaction with patients, tools, and devices were observed. Pictures were taken from devices and tools that nurses were using to prevent patients from falling.
Affinity Mapping

Affinity mapping is a process used to externalized and meaningfully cluster observation and insights from research, keeping design teams grounded in data as they design. Affinity mapping use when we have complicated and complex challenges to grasp, and it usually utilizes after data collection through interview or survey.

During this activity, each data record on the post-it with pens and will stick to the wall, roll paper or whiteboard. They should be visible to all research team. It is essential that no one talk during this activity and each one read the data. They should look for related ideas and place them side by side. They should repeat this activity until all notes are grouped. It is ok if we find some notes which are not related to any group. We can have a parking lot to collect all those notes. After grouping all ideas, it is time for the research team to start talking and share their experience during data grouping. They can talk about the shape of the chart or any interesting patterns. It is ok if they still move some ideas to other groups during idea grouping. When ideas are grouped, it is time to find a heading for each group, after this step it is time to combine those groups into supergroups.

Challenge Mapping

An effective way to frame a problem is by Challenge Mapping the original question. This helps generate additional questions, some more abstract and others more tactical. This presents a few perspectives to consider and can help identify specifically what the team needs to focus on. During this stage design research team write the original question on the single box in the middle of the challenge map, then by asking why Question They will generate more questions. They will continue asking why questions to complete all six boxes all the questions are more abstract than the original question. It is going to help them create more creative ideas to solve their challenge. Now it is time to ask more technical questions by asking what is stopping us? In the end, they framed some questions that help design team to choose one of the questions that make more sense for them.

Affinity Mapping process

Affinity mapping is a process used to externalized and meaningfully cluster observation and insights from research, keeping design teams grounded in data as they design. Affinity mapping use when we have complicated and complex challenges to grasp, and it usually utilizes after data collection through interview or survey.

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Participants identified three main fall risk factors.
1. Nurses/Staff
2. Medication
3. Physiological condition

Data showed that the current AAU floor plan was well-designed. There was a right distance between bathroom and patient's bed. When bathrooms are too close to patients' beds, patients may think they can manage walking to the bathroom. And when bathrooms are too far from patients' beds, they might not walk to the bathroom despite getting help. There was also a chair close to the patient's bed which provided easy access.

Here are some recommendations that were provided to the hospital based on the data:

• First, find a solution to stop water that comes from the shower to the other side of the bathroom. Because it causes slippery floor.
• Adding handrails to the both sides of the toilet. That helps patients to control their balance.
• Using alternative material for the floors, since the current material was slippery, especially when patients leaving the bathroom.
• Using glass windows on the bottom of the bathroom doors close to the sink. It helps nurses to monitor patients without opening the bathroom door. Windows can be covered in case patients need their privacy.
Based on the observation, after patients are transferred to AAU, nurses talk to the patients and explain them the reasons they are in AAU and all the safety and preventive tools. Here are some of the tools that nurses and healthcare provider use to identify patients with risk of fall:

- Yellow door sign.
- Yellow blanket

There are also some tools and devices which help them to prevent patient falls:

- Yellow un slippery sucks
- Bed and chair alarm
- Suma bed

Remote control to inform nurses in case if they need any assistant or when they need to get up from their bed.

Data Analyzing

Based on the data analysis during problem and fact-finding the following maps were designed to show the challenges within AAU.
Patients do not ask for help because of their pride.

They do not want to wait for nurses to come and help.

Patients think they do not need help.

Patients do not know how sick they are.

Patients do not realize that their body is reacting differently.

Patients do not know about their condition.

Patients do not want to rely on someone.

They overestimate their abilities.

Patients are not aware that they are not in a normal situation.

Patient’s Error

Get up to go the bathroom.

Move in the bed.

Transfer from chair to bed and vice-versa.

Get up from chair or bed.

Slide from chair.

Patients with blood pressure will fall if they get up fast.

Patients cannot stand because of illness.

Lose consciousness.

Hypertension.

Dehydrated.

Procedures policies.

Education.

Paranoid patients.

Age.

Medical side effects.

Patient with surgery are confused.

Dementia.

Alzheimer.

Patient Falls

Medication.

Floors are slippery especially when they are wet.

The different setting in the hospital versus patients house.

Changes in surface and height.

The distance between bed and bathroom.

Environment

Chair.

Crutches.

Furniture location in the room.

Wires on the floor.

Lack of signage.

The material of the chair.

Patients physical capacity assessing.

Sliding boards.

Fall precaution inside and outside of the patient’s room.

Lighting our of the patient’s room.

Video monitoring.

Gate belts.

Nursing sign sheet on the door.

Soma Bed.

Lighting.

Walker.

Bed alarms.

Bed’s rails should be up.

Handrails.

Yellow wristband.

Wrist restraints.

Equipment

Be careful about the cables on the floor.

The table should be close to the patient’s bed.

Educate patients why they are at risk of fall.

Educate staff about body mechanism.

Patient Care Assistants (PCA) make sure gait belt is working and ask for an assistant to help patients.

Screen patient before discharge.

Make sure every morning team holding and share patient’s information.

Inform next shift nurses and Procedure coding system (PCS).

Make sure the floor are not slippery.

Turn on chair’s alarm when a patient sets on the chair.

Educate patients to use alarm when they need help.

Keep the recliner close to the patient’s bed.

Make sure bed’s alarm is on.

Keep high-risk patients close to the nursing station.

Nurses educate patients when they transfer to Acuity Adaptable Units.

Nurses perceptions of why patients are falling.

Healthcare

Too many tools for fall prevention falls for nurses to choose.

Prevent patient’s injury during fall.

Keep on eye on patients to keep them safe.

Bed’s alarms are not calibrated.

Nurses relationship with patients.

Patients with Alzheimer and Dementia.

I nurse assist four patients.

How to assist patients as soon as patient asked for help.

How to educate patients to go through technology.

Nurses cannot see the video monitoring.

Get nurses to use all the prevention tools that are available.

Physicians are not educated on preventative tools.

It is not nurses job to take patients to the bathroom or help them walk.

Not enough resources like manpower.

Lack of adequate nurses during the weekend.

Nursing does not ask for help if they need.

Identified patients who are at risk of fall.

Patients participations.

Nurses need more hands for assistant.

Physicians do not allow to use four side beds up.

Number of staff who transfer the patient into the room.

Staff make sure that patients are safe.

Keep patient to the place and time.

Bedroom’s floor is slippery.

No extra chair in patient’s room.

Clear door or use curtain to have an eye on patients.

Handrails can help nurses to help patients.

Patient’s room is cluttered.

Chairs are slick.

Who are confused might want to use it.

Enough space to work.

Use shower chair.

Trashcan location in the bathroom.

The distance between bed and bathroom.

Falls on the way to the bathroom.
First category of patients feel independent and do not want to rely on someone for their daily activities. They believe they can take care of themselves and they can get up from their bed and walk in the room without asking for help or calling their nurses. Some don’t want to bother their nurses. These patients usually overestimate their abilities and do not fully understand their physical capacity. Sometimes they do not want to wait for their nurses to come and help them. The challenge statement for this category of patients is How might we encourage the patients who overestimate their abilities and feel independent, to ask for help when they want to get up from their bed?

The second category of patients suffer from Alzheimer and Dementia. This category of patients also include altered mental status who are confused. They sometimes are paranoid or confused because of the surgery. This type of patients are at risk of fall and need their nurse assistance to get up from their bed and do their activities within their room. However, they usually forget to ask for help. The challenge statement for this type of patients is How might we remind patients who forget to ask for help when they want to get up from their bed?

Name: Alex
Age: 65-70
Occupation: Retired
Education: High school
Location: Indianapolis
Relationship: Single
Children: 2
Patient status: Knee injury, Risk of fall
Currently he feels...  
• Annoyed
• He is not aware that he is not in a normal situation
• He overestimate his abilities
• He doesn’t want to wait for nurses to come and help
• His autonomy. He thinks he can get up by himself
• He doesn’t ask for help because of his pride

About me
I’m living alone in my house in Indianapolis. I lost my wife when I was 50. I have two sons and they are not living in Indianapolis. I didn’t have a chance to continue my study after high school. I was a football player, and I’m still feeling strong. I can take care of myself and do my daily jobs. I fell down in my house and they brought me here. I have been told not to get up from my bed alone, and ask for help if I want to get up. It’s annoying. When I want to get up the bed’s alarm, get active, and I hate the alarm. Everything is close to me, and I can walk and take care of myself. I

Name: Anna
Age: 50-55
Occupation: Retired
Education: Bachelor Degree
Location: Indianapolis
Relationship: Married
Children: 1
Patient status: Hip friction, Risk of fall
Currently he feels...  
• Exhausted and tired
• Struggling to remember recent activities
• It is hard to follow conversations with nurses
• Forget the names of friends and objects
• Difficulties to think and respond
• Feels confused when she is in new environment

About her
“She is living with her husband in Indianapolis. She has a daughter and two grandsons.” Her husband said she fell in bathroom. She does not remember where and why she fell down. When nurses moved her into her room, her nurse tried to explain to her why she is in the hospital, and why she is at risk of fall, and to prevent her from falling again, she needs to use the alarm to ask for nurse’s assistance. If she needs to use the bathroom or have access to her belonging she needs to use her alarm. Nurse’s challenge is that she keeps forgetting to use the alarm and ask for help. She tries to get up by herself. So nurses need to keep her close to the nurse’s station to have eyes on her.
Ideation Session

Mind mapping is one of the best ways to capture our thoughts and bring them to life in visual form. Beyond just note-taking, though, mind maps can help us become more creative, remember more, and solve problems more effectively. A mind map is a diagram that connects information around a central subject.

During this activity, Participants write the main idea in the middle of the board. Based on the main idea participants generate ideas which are related to the main one, and they become branches of the main idea. During this activity, participants should consider short phrases or even single words. For the last step participants should try to think at least two other ideas based on each sub-ideas. That way they generate a tree with branches which are the ideas that had generated from the main idea.

After identifying the challenges statements, stakeholders were involved in the idea finding step. During this step, stakeholders used specific methods to generate ideas. Two methods were used to facilitate participants to generate and evaluate ideas in the idea finding phase. Participants were explained some regulations to follow in this stage. The definitions of converge and diverge were also explained to them. Diverge happens at the beginning of the activity where participants generate ideas without judgment or self-editing. The purpose of this stage is to generate as many ideas as they can. In converge, participants were guided to narrow down their ideas. They evaluate each idea by designing different criteria.

Prototype ideation session was done with the nursing student at IU Health Arnett Hospital to make sure all the methods work properly. The results of the activity was interesting. Participants were engaged and generated many ideas. However, the ideas were not as diverse, since all the participants were nursing students and had similar work experience. Therefore for the next ideation session participants with more diverse background were invited, including AAU’s managers, registered nurses, user experience designers and on medical student and the result was amazing.

Two methods of mapping and brainstorming were used in the ideation session. During mind mapping, participants generated different ideas for persona 1, patients who feel independent and they do not ask for help. During this activity participants wrote their ideas on the role paper. To generate ideas for patients with persona 2, brainstorming mapping was conducted. Each participant wrote their ideas and put them up on the whiteboard.
Evaluate and select idea

At the end of the mind mapping, participants evaluated different ideas and selected one. They applied score game and used marker to vote 3 ideas to prevent patients from falling. They reported motivating patients to ask for help instead of asking them to call for help would be the best solution.

Participants selected some criteria to help them to converge, including Time, Budget, Manpower to implement the idea and originality of the final idea. At the end, they chose Voice Recording Reminder to help patients who keep forgetting to ask for help. This voice recording technique will remind patients to ask for help if they need to get up from their bed or do any other activities.
Conceptual solution

Finalizing the two ideas in the ideation session led to conceptual design of the final solution. Final solution was called ESCORZI, a combination of Eskenazi + Score. ESCORZI is connected to the patients database. It works with WIFI and Bluetooth and because of the patient’s privacy, it is only connected to the hospital network.

ESCORZI is presented to patients when they are transferred to AAU. Nurses can check patients condition on the device and set up different challenges for the patients. Nurses also can check patients score every hour. Instead of sign up sheet on every patient’s door, nurses can use the device to sign and check patients and also confirm their points. Nurses can also record their voice for patients and schedule when the voice needs to be played, for example reminding patients to ask for help if they need to get up from their bed or if they need an assistant.

Patients are able to communicate with nurses via ESCORZI. For example, if they press Get Up bottom, nurses are notified that they need to get up. They get additional scores when their nurses helped them to get up. Patients get motivated to ask for help when they need help. Patients can also see their physical condition, assigned nurse, and the remaining time to their next medication on their device. At the discharge time patients will receive gifts and prizes based on the score they have collected on ESCORZI.
There are four key limitations to this research that are important to address. Each of these limitations are described in more detail on the following pages.

1. Only work with one hospital, Eskenazi hospital
2. Involve stakeholders from one specific unit, acute adaptability unit
3. Involve stakeholders in the whole design process
4. Measure the outcome solution
AFFINITY DIAGRAM
A tool used to organize a large number of ideas, sorting them into groups based on their natural relationships, for review and analysis.

ANALOGOUS SITUATIONS
An analogous situation is a situation from another area or industry that may relate to an area of focus for a design and may suggest ways to improve it.

CO-DESIGN
Process in which the design team directly engages end users to assist in the design to access knowledge that is crucial to develop successful design solutions. The designers should provide ways for people to engage with each other as well as instruments to communicate. be creative, share insights and envision their own ideas. The co-design activities can support different levels of participation, from situation in which the external figures are involved just in specific moments to situations in which they take part to the entire process. building up the service together with the designers.

CONVERGENT
Process of Narrowing down ideas through synthesis.

COLLABORATIVE DESIGN
Inviting input from users, stakeholders and other project members.

DIVERGENT
Expansive idea generation and exploration of ideas.

EMPATHY
Principle in the design thinking process and human-centered design, in which the user's perspective is always represented.

ETHNOGRAPHY
The process of gathering information about users and tasks directly from users in their normal work, home or leisure environment.

HIGH FIDELITY PROTOTYPE
A prototype which is quite close to the final product, with lots of detail and a good indication of the final proposed aesthetics and functionality.

HOW MIGHT WE? (HMW)
A positive, actionable question that frames the challenge but does not point to any one solution.

INSIGHTS
Ideas or notions expressed as succinct statements that interpret patterns in your research and can provide new understanding or perspective on the issue.

ITERATE
The act of repeating a process with the aim of approaching a desired goal, target or result. Each repetition of the process is also called an iteration. In design thinking it refers to the cycles of prototyping, testing and revision.

JOURNEY MAP
A visual representation of a particular person or persona's experience with a service. The experience is documented over time and often shows multiple channels.

MINIMUM VAILABLE PRODUCT (MVP)
A minimum viable product is a simple version of a new product which allows a team to learn the maximum amount about customers with the least effort. The goal of an MVP is to test fundamental business hypotheses as efficiently in the real world as possible.

PARTICIPATORY DESIGN
An approach that involves stakeholders such as clients, end users, community members in the design process to ensure that the design meets the needs of those it is serving as well as generating buy-in. A type of social research in which the people being studied have significant control over and participation in the research.

POINT OF VIEW (POV)
In design thinking, a POV means the point of view of a very particular person. Creating a point of view involves synthesizing the data gained in the Understand and Observe phases in order to create a common reference/inspiration for later ideation and prototyping. The idea is to focus on a real person, with many of the concrete details found during the Understand/Observe phases. One approach is to develop one or two concise sentences that express User+Need+Insight.

PROTOTYPE
A prototype is a model built to test a concept with end users in order to learn from. Prototyping helps understand real, working conditions rather than a theoretical conditions.

STAKEHOLDER
A person, group, or organization directly or indirectly involved or affected by a product, service or experience.

SYNTHESIS
The sense-making process in which research is translated and interpreted into insights that prompt design. Useful frameworks for synthesis include journeys, Venn diagrams, two by twos and maps.

STAKEHOLDER MAP
A visual representation of the stakeholders in a service and the relationships between them.

TOUCHPOINTS
A touchpoint is any point of contact between a customer and the provider of a service, product or experience. A touchpoint is where a potential customer or customer comes in contact with your brand before, during and after a transaction.

WICKED PROBLEM
A wicked problem is a problem with contradictory, and changing requirements.
References


References
Interview questions

Card Sorting

Card Sorting Board

Layout Plan

Layout Plan Furniture

Observation form

● Could you please introduce yourself.

● What is your role at Acuity Adaptable Unit?

● How long have you been in this role?

● In what other hospitals or other setting have you worked before?

● Why do you think patients are falling?

● How often do falls occur on the Acuity Adaptable Units?

● How do you prevent patient falls from occurring?

● What are your challenges or barriers in preventing falls?

● Explain how patient falls impact your current role.

● What are your challenges or barriers to prevent falls?

● How do you determine a patient is at risk for falling?

● Walk me through the process after a patient falls in Acuity Adaptable.

● How do you think the incidence of patient falls impacts the reputation of your hospital?

● How can you prevent patient falls from occurring?

● Describe physical environment changes in acuity adaptable units that may prevent falls.

● Describe how a patient’s room layout could prevent falls.

● Is there anything else that you want to tell me about the incidence of patient falls?

● Could you please introduce yourself.

● What is your role at acuity adaptable unit?

● How long have you been in this role?

● In what other hospitals or other setting have you worked before?

● Why do you think patients are falling?

● How often do falls occur on the acuity adaptable units?

● How do you prevent patient falls from occurring?

● What are your challenges or barriers in preventing falls?

● Explain how patient falls impact your current role.

● How do you take care of patients who are at high fall risk?

● Describe physical environment changes in acuity adaptable units that may prevent falls.

● Describe how a patient’s room layout could prevent falls.

● Is there anything else that you want to tell me about the incidence of patient falls?

● Have you or your family member experienced a fall?

If the answer is YES: I’ll ask the following questions

● In general, why do you think patients fall?

● Explain to me why you think patients fall.

● How does fall affect families and their experience with the hospital?

● How could the hospital and nurses prevent your family member from falling?

● How could the physical environment and equipment prevent patient falls?

● Is there anything else that you want to tell me about your family member’s fall?

If the answer is NO: I’ll ask the following questions

● In general, why do you think patients fall?

● Explain to me why you think patients fall.

● How could the hospital and nurses prevent your family member from falling?

● How could the physical environment and equipment prevent patient falls?
<table>
<thead>
<tr>
<th>PEOPLE</th>
<th>OBJECTS</th>
<th>ENVIRONMENT</th>
<th>MESSAGES</th>
<th>SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>List main group of people</td>
<td>List objects that are used by the people and that populate the environment</td>
<td>Describe the surroundings. What are the main features?</td>
<td>What are the messages or conversations being communicated and how?</td>
<td>List services being offered. List services available to the people.</td>
</tr>
</tbody>
</table>

**COMMENTS ABOUT USER’S EXPERIENCE:**

**GENERAL THOUGHT & COMMENTS:**