INSTITUTIONALIZATION OF USABILITY IN BANKING SOFTWARE ENVIRONMENT: TASKS AND CHALLENGES

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This paper looks at typical banking software environment and challenges faced by usability team to be effective and useful.

Usability team needs to work on multiple threads at the same time to be effective, visible and recognized. It may take a couple of years before any concrete results can be seen. The objective for a usability group is to be a part of the PDLC as a self-sustaining unit which does not depend on the blessing of the senior management.

The paper articulates several challenges and the steps taken by a new usability team to achieve recognition and be an important player in the overall scheme of things.

Integration of usability process into PDLC helped banking software receive high ratings from clients and have helped the banking software to be among the top three software globally as per Celent, Forrester and Gartner reports.

Keywords: HCI, Human factors, Design methodology, Design Management, User centered design, User experience design, Usability Analysis, Interaction design, Heuristic evaluation, Banking & financial software design.

1. INTRODUCTION

Usability is relatively a new discipline in the Indian banking scenario. It is extremely difficult for a new discipline like usability to get integrated[1] into the existing Product Development Lifecycle (PDLC) which has settled over the years with product development teams. Usability team believes in customer focus and constant product improvement. This philosophy tries to shake up the "well-settled" PDLC process and tries to change the product development paradigm from "usage centered design" to a "user centered design" (UCD).

Any change brings in resistance and justification for its need and benefits is required. There may be barriers for development teams to take up usability.[2] In such cases, development teams only focus on "low hanging fruits" and drop the bigger picture of overall improved product usability. Hence, the product usability is merely reduced to "look and feel" improvement.

Usability needs to play a pivotal role in product development to save costs of rework and customization.[1] With fierce competition in the banking software market; all major players have more or less similar capabilities and functional equivalence. The main differentiator has been the cost of development and software usability.

Many IT organizations have a usability practice but it needs blessings from the senior management to survive.[1] It takes quite an effort and time for usability to become a self-sustaining practice.

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1.1. Objective

The objective of this paper is to look at steps that need to be taken to institutionalize usability in a banking software environment. To achieve this, challenges need to be understood and tasks and possible solutions need to be worked out.

1.2. Need

Usability has picked up visibility in the last 10–15 years in the banking and financial application domain. User centered design (UCD) process followed by usability group needs to be integrated into already established PDLC. More and more banking clients are looking for usable banking solutions which have smaller learning curve and higher productivity when it comes to completion of repetitive and monotonous tasks.

Usability integration at early stages of PDLC saves rework[1] towards the later stage of PDLC. Many features and behaviors can be defined early in the development lifecycle by usability analysts thus bringing consistency into software products and its interactions.

It has been observed that if a relatively simple improvement like reduction of one mouse-click is implemented in a critical and high volume banking transaction like "view payment" and "create payment", it can save thousands of clicks and many hours in a large banking environment.

1.3. Scope

The scope of the paper is limited to setting up the usability practice and processes in an existing banking software product company.

The scope of this paper does not include testing or usability process integration with any other products group or services business.

1.4. Methodology

The methodology to institutionalize usability in a banking software product environment may need to include most the following activities:

- Understand banking and financial domain
- Understand development, delivery and deployment lifecycle, processes followed and related issues
- Prepare vision and strategy document. This will be based on the requirements and direction from the senior management and product heads
- Develop a clear engagement model with various stakeholders
- Identify the stake holders, like — subject matter experts (SME), sales team, product development, deployment teams and so on
- Collation of feedback, requirements and end-user's wish list
- Carry out a pilot exercise and circulate results (usability review or redesign of a complex screen)
- Study typical issues and challenges faced by usability team
- Update strategy document based on the issues and challenges
- Circulation of usability tools and findings, which clearly explain the value preposition of usability

2. ACTIVITIES AND TASKS

Making banking software usable needs an understanding of workflow in a bank and its user profile. Based on the user profile, one can understand the workflows and scenarios of back-office, mid-office, front office and end user facing applications.[3]

Banking workflow usually starts from an end user (online banking) or front-office layer like the teller application. In some cases, the workflow can be completed at the front-office layer, but in most cases, the front office is just a medium to collect a request which is to be resolved by mid-office or the back-office layer.

Usability Activities

	Task	Purpose	Description	Techniques	Work Products	Integration
1	User Profiles	Establish user characteristics around which the UI design must be tailored.	Develop a description of intended user population in terms of characteristics relevant to UI design	Questionnaire distributed to users	Questionnaire/ interview form	Drives virtually all other tasks except Platform Capabilities / Constraints.
2	Contextual Task Analysis	Obtain a user- centered model of work as it is currently performed and extract from this the usability requirements for the product.	Conduct a study of users in their actual work environment performing their real work	Contextual observations/ interviews.	Work environment analysis	Users to study are identified in User Profile.

Figure 1. Snapshot of usability tools and techniques (part picture).

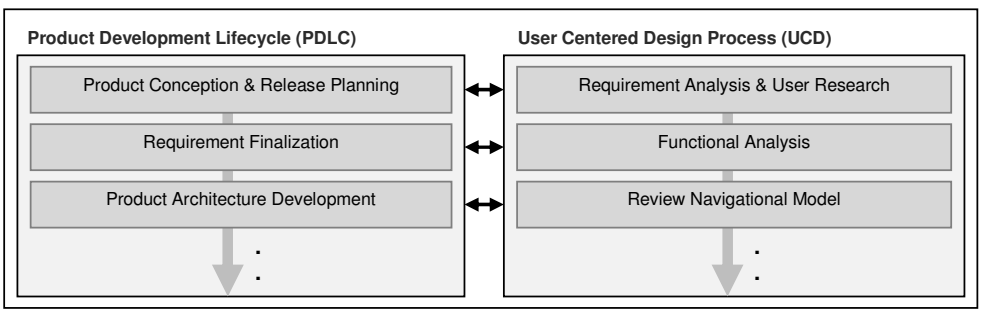


Figure 2. Snapshot of engagement model — UCD integration with PDLC (part picture).

While the end user-interfaces need to be clean and simple, the mid-office and back-office interfaces need to be a "one-stop-shop" to do everything. Completing repetitive tasks quickly is important for mid-office and back-office users.[3] To make banking product more usable, one needs to adhere to a process where usability and consistency is evaluated at each stage rather than towards the end of the product development.

Usability team needs to clearly define and prepare documentation on - engagement model (Figure 2), stakeholder's interaction pattern (Figure 3), usability process (such as Section 2.2), UI guidelines (such as Section 2.3), usability review metrics and some success stories. These will help usability team work with a well-defined direction and spread awareness to other teams about the vision and mission of usability practice.

Usability tasks[2] and activities (Figure 1) need to be appropriately selected[4] and implemented at the right stage of software development.

2.1. Engagement Model

Integration of usability process with development lifecycle can be a big challenge.[1] For most software development organizations, usability processes need retrofitting[1] with existing development lifecycle. Appropriate usability tools and activities need to map with PDLC. The following snapshots represent a typical engagement model (Figure 2) with stakeholders (Figure 3):

2.2. Define Usability Process

In order to set-up and implement usability process, it is important to understand the "hierarchy of needs"[5] which states that usability can work if needs like functionality and reliability have been taken care of. Once usability of a product is in place, the next step is to strive for proficiency and creativity.

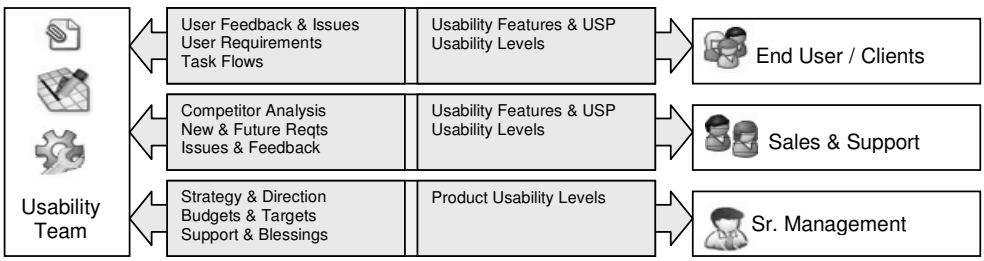


Figure 3. Snapshot of Stake-holders interaction pattern with inputs and deliverables (part picture).

As a start, implementation of usability process[2] needs to be taken up. Usability process has three main phases — analysis, design and evaluation.

2.2.1. Analysis Phase

The analysis phase looks at researching and analyzing whatever one can know about the end users, who will be using the application and the way in which they interact with their application. Some of the major activities involved are:

- Identify and understand the context of use
- Meet with key stakeholders to set vision
- Conduct field studies
- Conduct competitive products survey
- Conduct user analysis and create user profiles/personas
- Conduct task or work flow analysis
- Document user performance requirements
- Contextual inquiry
- Understand existing system, technology and limitations

2.2.2. Designs Phase

Design phase consists of many collaborative design and evaluation activities in which the end users are actively involved. High-level design requirements, system prototype, and design documentation are some of its major activities. Detailed activities are:

- Begin to brainstorm design concepts and metaphors
- Develop design strategy
- Conduct card sorting
- Develop information architecture, screen flows and design navigation model
- Develop paper prototypes
- Create low-fidelity prototypes
- Conduct Usability testing on low-fidelity prototypes
- Develop high-fidelity and detailed prototypes
- Develop page types or page patterns
- Conduct usability testing on high-fidelity prototypes
- Create visual design concepts
- Conduct walkthroughs of design concepts with users - contrast test
- Document standards and guidelines
- Create design specifications document

2.2.3. Evaluation Phase

Iterative user evaluation of designs are conducted in the evaluation phase. Working closely with the development teams helps in timely implementation of the solutions. Some of the major activities involved are:

- Evaluate proposed design
- Conduct usability expert review with design recommendations & solutions
- Conduct heuristic evaluation
- Implement suggested design solutions
- Work closely with delivery team for implementation
- Conduct usability testing on implemented design solutions

Test and Release:

The last phase involves conducting formal usability testing, iterate if required and release the designs. Some of the major activities involved are:

- Conduct surveys to get user feedback
- Conduct field trials
- Conduct formal usability testing
- Release the findings and report

Usability testing and evaluation need to happen at every stage of the development process. UI standards are used as guidelines for designing and developing interfaces to achieve maximum usability impact and benefits.

2.3. UI Guidelines, Usability Tools and Review Metrics

UI guidelines and style-guides help in managing application UI. Many issues such as inconsistency in screen design can be eliminated if a well written UI guideline document is circulated with the development teams. (Figures 4 and 5).

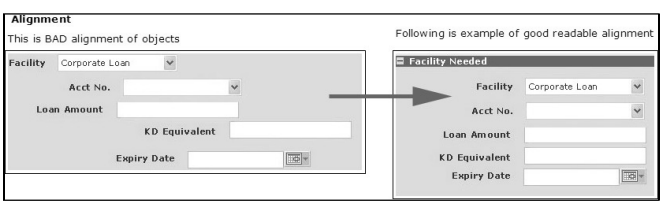


Figure 4. Snapshot of a UI Guideline.

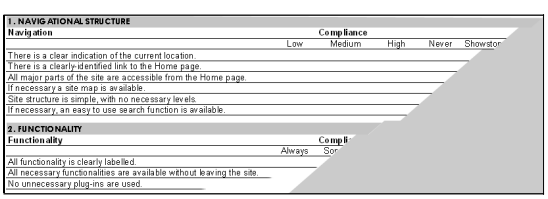
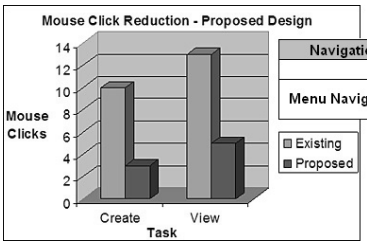


Figure 5. Snapshot of usability review metrics.



Navigation	Task	Number of Mouse-Clicks & Time Taken		
		Existing clicks (time)	Proposed clicks (time)	Reduction in clicks (time)
Menu Navigation	Create	**10** (5.2 s)	**3** (3.7s)	**70%** (29%)
	View	**13** (5.2 s)	**5** (3.7s)	**62%** (29%)

Figure 6. Reduction in number of mouse clicks achieved by menu and screen redesign.

2.4. Pilot UCD process

Once usability team has completed required documentation, a pilot project can be initiated on a small application to implement all the stages of UCD. This will help the usability team discover if there are any missing pieces in the process and if any additional activity needs to be taken up.

2.5. Share Success Stories

Usability practice needs to clearly articulate if any major refinement and improvement have been achieved.[1] Some of the achievements which make visible impact are:

- Before and after application screens (existing and revamped designs)
- Simplification in navigation design without changing existing screen-flow
- Reduction in number of mouse-clicks which increases end user productivity, such as in Figure 6. Reduction in number of mouse clicks can enhance the productivity of a user of banking application - where task repetition or doing the same task hundreds of times per day is prevalent. Saving one mouse click can enhance productivity of certain banking tasks by over 5-10%. Such tangible data is good selling point for sales teams.

2.6. Identify generic areas of improvement

Some of the generic improvement areas may be:

- Numbers of steps can be reduced or optimized
- Number of mouse-clicks can be reduced or optimized
- Improvement in keyboard navigation
- Grouping of scattered tasks in application across multiple modules
- Displaying permitted modules and actions to the user based on his role and access rights
- Multiple ways to navigate to a particular task
- Allow users to manage preferences

2.7. Refine Solutioning Process

The following are some of the possible solutions to enhance usability impact:

- Understanding application functionality, architecture and platform specifications. Attack the tools and architecture teams for larger impact
- Understand client expectations through proposals (RFPs) and user acceptance tests (UAT).
- Participate in meetings where high level decisions are taken – including those for product direction and product roadmap.
- Change mind-set of development teams by involving then in UCD activities like co-creation and collaborative design and solutioning.
- Create awareness in product teams by including developers and product heads in user test sessions

- Usability training sessions for product and sales teams for pitching usability as a unique selling preposition (USP)
- Write case studies and white papers which will spread awareness about usability in the organization
- Involvement of usability professionals in product implementations to understand client specific customization and try to bring back some of the generic features back into core product
- Be ready with a few "proof of concept" (POC) and product specific new ideas which may be show-cased for further research and implementation of new and important releases
- If usability lab or usability group has already been set-up, show-case usability capability to senior management and important clients to increase visibility
- Building personal relationships with some key people who can help in promoting usability

3. CHALLENGES AND ISSUES

Challenges and bottlenecks need to be identified and resolved one by one.

3.1. Challenges for Usability Team

- Budgeting and staffing for usability group and issues like lack of budget for conducting field research and user surveys
- Access to subject matter expert (SME) for understanding product functionality
- Non-availability of product plan for sustained engagement
- Delay in decision making for implementation of key usability and UI issues and recommendations
- Non-availability of client requirement details
- Lack of will from product teams for product usability improvement
- Delay in implementation of UI and usability recommendations
- Engagement with usability team in the last stages of product delivery
- Missing usability review before final delivery to the client
- Intermittent access to the latest version application for usability evaluation
- Non-availability of documentation on product training

3.2. Challenges with Product Development Teams

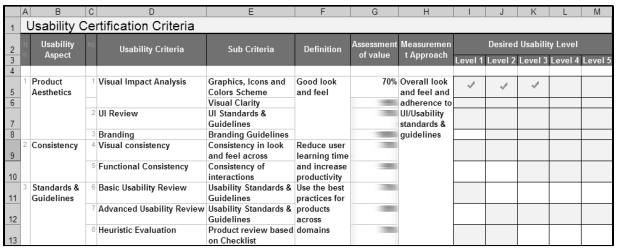
Resistance to change is a major roadblock and there is little that one can do in such a situation. One needs to work tirelessly to change the mindset of development and deployment teams. In many critical and high pressure scenarios, the product development and delivery teams may not adhere to the integrated PDLC as there is fear of delay in development lifecycle and delivery deadlines if usability processes are involved.

Lack of awareness to look at user's needs is another challenge. Many teams follow "usage centered design" process rather than "user centered design" process. There may also be less understanding of business domain and detailed application functionality. In some cases, it is extremely difficult to convince senior management and decision makers on value of usability as they feel that this is more a request of sharing of decision making power. This may be due to organizational structure and practices or because of myths, beliefs and attitudes.[2]

4. STRATEGY AND ADDITIONAL STEPS

At start, usability team needs to take up activities which make more impact with minimum effort. Once the results of such an effort are visible, the usability team needs to undertake more challenging and critical tasks like usability testing and product revamp.

Usability team needs to implement all the stages of user-centered design process for one banking product and show tangible benefits. This activity may become a reference point for the rest of the development groups to look at and engage with the usability team. Usability approach may need



Usability Certification Criteria											
Usability Aspect		Usability Criteria	Sub Criteria	Definition	Assessment of value	Measurement Approach	Desired Usability Level				
							Level 1	Level 2	Level 3	Level 4	Level 5
1 Product Aesthetics	1	Visual Impact Analysis	Graphics, Icons and Colors Scheme	Good look and feel	70%	Overall look and feel and adherence to UI/Usability standards & guidelines	✓	✓	✓		
			Visual Clarity								
	2	UI Review	UI Standards & Guidelines								
	3	Branding	Branding Guidelines								
2 Consistency	4	Visual consistency	Consistency in look and feel across	Reduce user learning time and increase productivity							
	5	Functional Consistency	Consistency of interactions								
3 Standards & Guidelines	6	Basic Usability Review	Usability Standards & Guidelines	Use the best practices for products across domains							
	7	Advanced Usability Review	Usability Standards & Guidelines								
	8	Heuristic Evaluation	Product review based on Checklist								

Figure 7. Snapshot of usability certification metrics.

to be tailored[2] to suit the requirements of back-office, mid-office, front office and end-user facing applications.

Usability team needs to change the mindset of the stakeholders including the development teams and product management[1] to improve participation in usability initiative. The politics of usability is governed by factors outside of the usability team and its work. The selection of usability technique depends on the "usability maturity" of the company.[6]

Usability cannot be improved only by a few people. It needs to be integrated into the product development culture by co-creation and collaborative design and solutioning. "Usability Champions" need to be identified from each development team[7] to take usability initiative forward. A central usability team with a "Chief User Experience Officer" (CXO)[1] is most effective. There is a need to tailor the approach of making recommendation to the product teams with the right level of detail and specificity.[6]

If it is difficult to involve the delivery teams to get their application reviewed, usability team can develop and implement a usability certification model[3] to rate products from usability perspective. This will help determine product benchmarking internally as well as with competition, such as in Figure 7.

5. ANALYSIS

Integration of a new discipline like usability into a traditional banking software development environment can be quite a challenge. This needs support from senior management so that usability practice may stand up on its own. Usability also needs to tackle a few decision makers who believe that they know "what users want". In most cases these people are away from the real customers and may not know what is happening in the market.

Usability team needs to market[8] itself by showing its value[1] in terms of money and time saved. A pilot project is required to be undertaken as a case study to start with. Usability needs to market itself as a team with out-of-the-box thinking and innovative solutioning.

The only way for usability to survive on its own is to be tightly aligned to PDLC. A usability specialist needs to device usability activities depending on the level of usability maturity in the organization. In early stages, usability needs to show its value and capability. Once the usability practice is visible and settled down, one need to look for path breaking solutions and start engaging with customers. In the third and final level of maturity, usability team should start looking at research and innovation.

Usability professionals needs to constantly assess usability maturity of banking software. This is critical to define usability strategy and validate direction in a dynamic banking environment.

Institutionalization of usability practice across all the stages of PDLC triggers a competition among product development teams as creators of better software products than other groups within the organization as well as outside. PDLC with integrated UCD takes less time[1] of about 6-9 months for completion of a complex banking software development. This is an important achievement considering it took years to design and develop banking software using traditional PDLC. Usable products are known to sell more.[1]

Usability capability needs to be developed in each and every developer and deployment manager. They need to start looking and software development from the end user's perspective. Once every stakeholder in an organization starts contributing towards usability, usability team may take up the role of a Center of Excellence (CoE) which is involved in cutting edge research and solutioning.

6. NEXT STEPS

It may take many years before we may see complete integration of usability into the development process of a banking software development organization. The benefits of usability may start appearing much sooner. One needs to look at flavors of other usability approaches like - TRUMP (TRrial Usability Maturity Process)[9], LUCID (Logical User-Centered Interaction Design)[10] and Rational Unified Process (RUP)[8] to further enhance usability strategy in dynamic and ever changing banking domain.

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