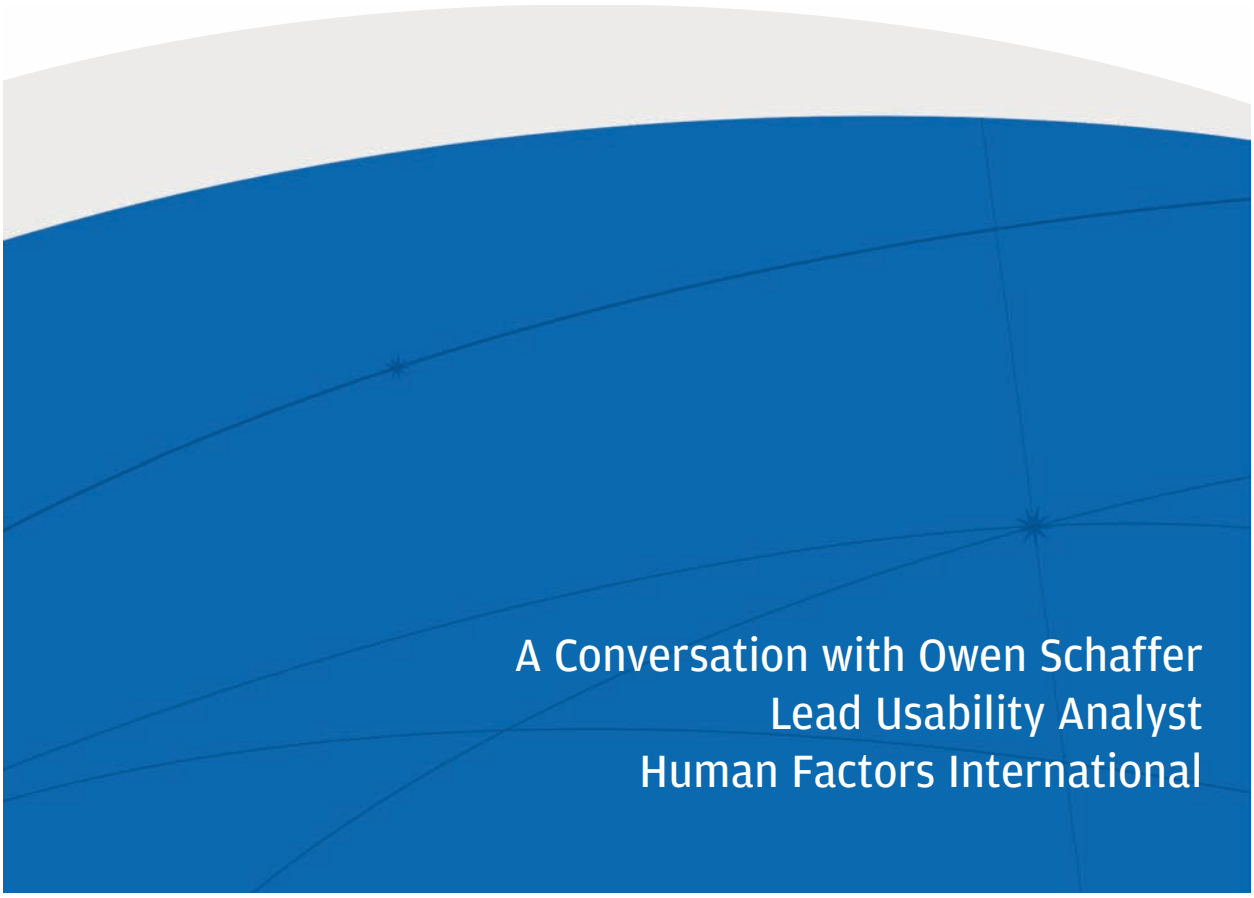
Human Factors International

Crafting Fun User Experiences

A Method to Facilitate Flow



A Conversation with Owen Schaffer
Lead Usability Analyst
Human Factors International

Crafting Fun User Experiences: A Method to Facilitate Flow

"Designing for flow is important for internal business applications, like a system used by bank tellers or people working in a call center. Finding meaningful challenges and getting clear feedback about progress on those challenges is the best way to make even boring or repetitive work more like an enjoyable game."

Owen, you've been doing a lot of work with persuasive design. How does making designs more fun relate to persuasive design?

Making designs more fun allows companies to engage their customers and give them an experience that will have them wanting to come back again and again. There are many different kinds of fun, but the fun of enjoying doing something for its own sake must be our top priority if we want to make designs that people will want to use. Positive psychologists call this kind of fun "flow."

"We can't just make designs easier to use anymore. We have to make things people will want to use."

Persuasion can be thought of as a story that goes from a trustworthy first impression, through an engaging emotional experience, to persuasion that will convince customers to take the desired action. The persuasion story continues with the sense of relationship customers feel with your business that leads to repeat business and loyalty. At each part of this persuasion story, we make designs more persuasive with different Persuasion, Emotion, and Trust (PET) tools. Flow is all about that emotional engagement part of the persuasion story.

I went to Claremont Graduate University to work with Mihály Csíkszentmihályi, the psychologist who created the concept of flow. He was still teaching at age 77, and he became my research advisor. With his help, I developed the Flow Condition Questionnaire (See Appendix, page 19), a measure of the conditions required to get into flow. The FCQ can make usability testing a better diagnostic tool. With the FCQ, we can go beyond finding and fixing usability problems. We can use the FCQ to create engaging and enjoyable user experiences. We can engineer designs people will want to use again and again.

We can't just make designs easier to use anymore. We have to make things people will want to use. When designs are fun to use, people will want to use them. So we have to make things that are fun to use.

What is flow?

Flow is the experience of doing something just because you enjoy doing it. It's the feeling of being "in the zone" while enjoying overcoming challenges. In a flow state, time seems to fly by as attention becomes effortlessly focused on the activity. Attention is so absorbed by the activity that no attention is left over to notice time passing and get bored, to worry about the future, or to worry about what others will think of us.

Share this white paper:

Flow is the experience of doing intrinsically motivated activities. Rather than focusing on what needs are satisfied or what benefits we get from the activity, flow focuses on the immediate and moment-to-moment experience of doing things for their own sake.

The experience of flow is:

- Intense and focused concentration on the present moment
- Merging of action and awareness
- Loss of reflective self-consciousness (loss of awareness of oneself as a social actor)
- A sense that one can deal with the situation because one knows how to respond to whatever happens next
- Distortion of temporal experience (typically a sense that time has passed faster than normal)
- Experience of the activity as intrinsically rewarding, such that often the end goal is just an excuse for the process

"Flow is consistent across activities, whether the person thinks the activity is play or work."

The flow experience is surprisingly consistent across activities, whether the person thinks the activity is play or work. The research on flow across wide-ranging samples and diverse activities shows how positive the experience is.

People in flow experience effortless concentration, enjoyment, and satisfaction. They want to be doing what they are doing. They feel like something is at stake in the activity and feel the activity is important to their future goals. Their self esteem grows, and they feel in control of their situation. People in flow also feel happy, strong, active, involved, creative, free, excited, open, and clear.

How do we get into flow?

The conditions required to get into flow, or the flow conditions, are:

- High perceived challenges
- High perceived skills
- Knowing what to do
- Knowing how to do it
- Knowing how well you are doing
- Knowing where to go (where navigation is involved)
- Freedom from distractions

Share this white paper:

By measuring how well designs meet these flow conditions and exploring how they can better meet the flow conditions, we can engineer designs that facilitate flow.

There's been a lot of confusion around the "clear goals" flow condition. Csikszentmihalyi and Nakamura (2010) clarified that it's not about having an overall goal for the activity. It's about knowing what to do next from moment to moment. So in rock climbing, you have to know the next piece of rock to move your hand or foot to – it's not about reaching the top of the mountain.

"Users go from one task to the next, continuously adjusting their performance to tackle the challenges they face."

It is not enough to just know what to do; you also have to know how to do it. If navigation is involved, you also have to know where to go. You have to be able to concentrate, so you must also be free from distractions that would interrupt your attention.

When the flow conditions have been met, users are able to engage in a series of challenging tasks that are not too difficult (not overwhelming), nor too easy (not boring). Every step of the way, it is obvious to users what to do next, how to do it, where to go next, and how well they are doing so they can continuously adjust their performance based on continuous, immediate feedback. In this way, the flow conditions create a flow loop, an unimpeded loop between action and feedback that allows for continuous and effortless tuning of performance while taking action. Flow loops make an activity worth doing for its own sake.

Users effortlessly go from one task to the next, continuously adjusting their performance to tackle the challenges they face. Action and awareness merge as all of their attention is taken up by the activity with none left over to experience boredom, anxiety, self-consciousness, to ruminate about the past or future, or even enough attention to notice bodily discomfort. This is what leads to the experience of flow.

How do we create flow loops?

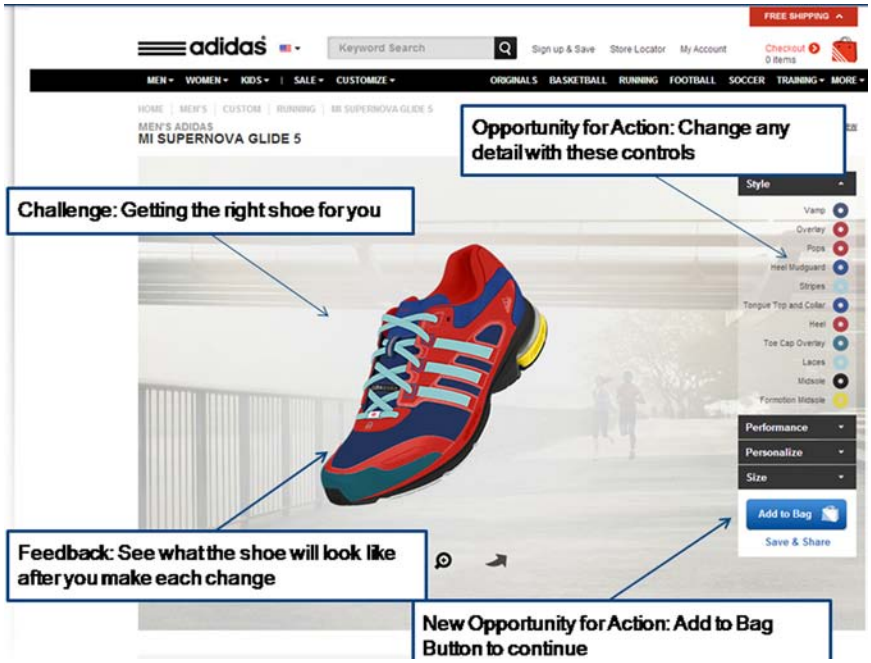
Creating flow loops means creating environments that allow users to play around with inputs or controls. It means creating challenges that are neither too easy, nor too difficult. It means giving immediate feedback that allows users to continuously adjust their performance as they tackle these challenges.

Share this white paper:

Examples of flow loops

Let's take the Adidas.com's shoe customizer as an example. You can change the color of each part of the shoe and right away see how the whole shoe will look with that change. You can add a jewel to the laces with your country's flag. You can embroider the strap with anything you type and in any color you want.

The challenge of the activity is finding the right shoe for you. The controls let you input all of these customization options. And the feedback is seeing right away what the shoe will look like after you make each change - not at the end after you have chosen all the options. This creates a flow loop.



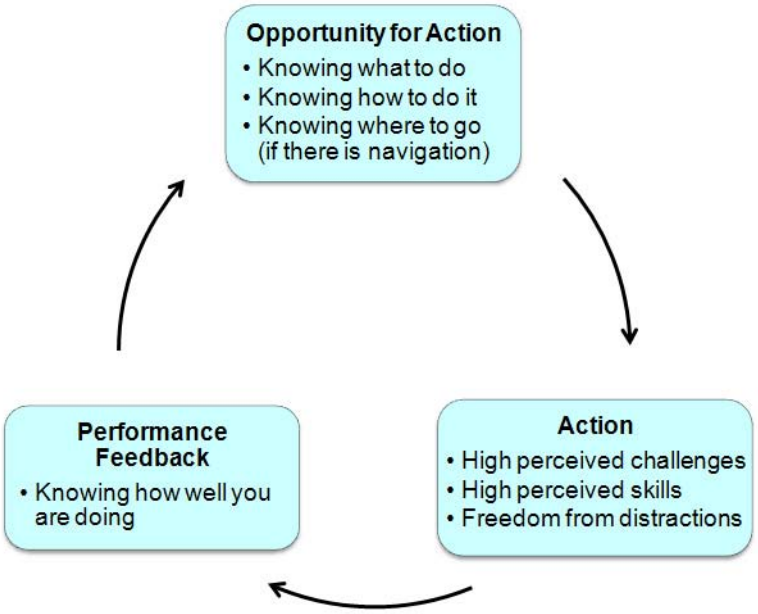
Adidas shoe customizer

DuoLingo.com is another good example of a flow loop. It's a free language-learning website that uses the practice work of the students to crowd-source text translation. The call to action is a sentence to translate and a text box with a blinking cursor to enter your translation. The challenge is getting the translation correct. After you enter your answer, you press enter or click continue and a green checkmark and the words "You are correct" give you immediate feedback showing how well you did. Then you can press enter or click the "Continue" button to go to the next sentence to translate.

Share this white paper:

Flow loop model with flow conditions

The loop between an opportunity to tackle a challenge, performance feedback, and a new call to action forms a flow loop:



Flow loop model with flow conditions

The same can be done with the challenge of finding the right hotel with the controls being search filters and the feedback being hotel listings with pictures of the rooms. Auction websites are all about making a competitive game out of out-bidding others - bidding wars. Surfing from product to product on Amazon.com using the "people who bought this also bought..." and the site's recommendations is certainly a kind of searching game because they have created an interconnected network of products, like a virtual jungle-gym.

Share this white paper:

When we do usability we're always trying to make things easier to use, but with flow we're designing challenging experiences. What's up with that?

The challenge that gets us into flow is the difficulty of the activity itself. Progressing through a series of challenges the activity presents to us gets us into flow. We're motivated by enjoying the challenges of the activity. These challenges are part of the activity, not outside of it. This is why flow is intrinsically motivating rather than extrinsically motivating: the motivation is intrinsic to the activity.

"An interface that is difficult to use is a frustration that is not part of the challenge of the activity. It's the activity we want to make challenging, not the interface."

Usability handles a different kind of difficulty. An interface that is difficult to use is like a broken tool or instrument. If you are playing jazz on a saxophone, a broken saxophone will not make it more fun to play. Playing more and more challenging music will make it more fun! Improvising is especially fun because you can control how challenging it is to play from moment to moment.

Just like a broken instrument, an interface that is difficult to use is a frustration that is not part of the challenge of the activity. It's the activity we want to make challenging - not the interface, tool, or instrument.

Gamification is a hot topic these days. What is gamification?

Gamification means making non-game designs more like games. But what is a game, and why do we want to make designs more like games?

Games are unnecessary obstacles we volunteer to overcome. Players volunteer to overcome these obstacles because overcoming them is enjoyable. Tackling the challenges gets them into flow. The core of what makes games fun is that games get players into flow.

When we create flow loops and make sure the flow conditions are being satisfied in designs that are not games, we are making them more like games. So this is certainly one kind of gamification.

Unfortunately, much of what is being called gamification has focused on adding rewards external to the activity, such as points, achievement badges, or virtual currency. The problem is that rewards external to the activity extinguish the flame of intrinsic motivation. In other words, trying to motivate users with rewards can make them feel controlled and less like they are playing a fun game.

Share this white paper:

Some are even shifting away from the word gamification because it has been used (or perhaps misused) so much to mean trying to control people with rewards. "Gameful design" also means making designs more like games, but it is focused on designing for flow, positive emotions, relationships, meaning, and other concepts from positive psychology. Personally, I prefer "engineering intrinsic motivation" or simply "making designs more fun."

Step 1: Identify your target experience

How do we engineer designs that get users into flow?

Usability testing is the standard when it comes to making designs easier to use. Participants come into a usability lab and are asked to think aloud and perform realistic tasks. Performance and behavior are observed to diagnose usability problems.

We can use the Flow Condition Questionnaire (FCQ) to make usability testing an even better diagnostic tool (See Appendix, page 19). The FCQ diagnoses how well designs satisfy the flow conditions. Using the FCQ during usability testing is the ideal way to engineer designs that facilitate flow.

Engineering designs that facilitate flow can be divided into 5 steps:

1) Identify your target experience
2) Choose baselines for comparison
3) Gather data
4) Analyze data and redesign based on insights of the data gathering
5) Iterate, iterate, iterate

Step 1: Identify your target experience

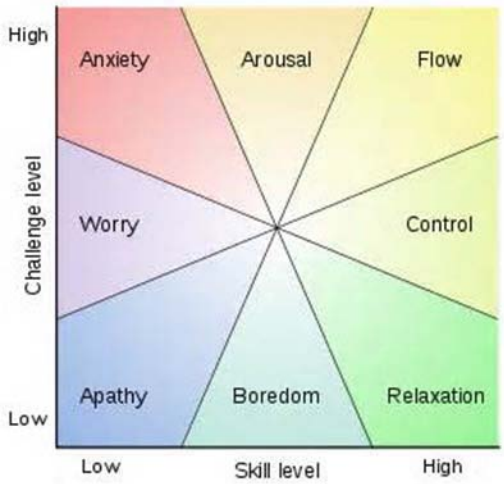
Because flow is such a positive experience, designing for flow will likely be our aim much of the time. However, there are some cases where other positive experiences may be more appropriate or desirable. There may even be different target experiences for different parts of the intended experience.

Share this white paper:

The experience fluctuation model showing the 8 channels of experience

For example, successful video games are often designed to go back and forth between intense, high-challenge moments of flow and moments of relaxation where the player can take a breather and prepare for the next moment of intense flow. So it is important to meet with stakeholders to agree on what the intended experience will be for each part of the user experience. Depending on the scope of the project, this could mean for each user task, for each set of tasks (scenario), or for each feature of the design.

The combination of different levels of challenge and skill predict 8 different experiences:



The Experience Fluctuation Model showing the 8 channels of experience

The first four channels are all positive in different degrees and are appropriate in different circumstances: arousal, flow, control, and relaxation. The last four are all negative: boredom, apathy, worry, and anxiety.

Share this white paper:

Flow involves intense and effortless concentration, intrinsic motivation, importance to future goals, self-esteem, and positive emotions. When your stakeholders want users to actively engage with challenges that require their full attention, they want that part of the design to get users into flow. This means your target is the flow channel of experience, high perceived challenges and high perceived skills. Keep in mind that skills and challenges are just two of the flow conditions – the others are just as critical.

"When your stakeholders want users to actively engage with challenges that require their full attention, they want that part of the design to get users into flow."

Like flow, relaxation is an enjoyable experience we enjoy doing for its own sake. But relaxation is not challenging, so it requires little or no concentration. While flow involves expending energy and using skills to face more and more complex challenges, relaxation is about conserving and regenerating energy. Typical relaxation activities include eating, personal care, and doing chores and errands. When your stakeholders want users to rest rather than concentrate on tackling challenges, your target experience is relaxation, the channel of experience with high perceived skills and low perceived challenge.

Control is between flow and relaxation, when users are more challenged than they would be if they were just relaxed, but not yet challenged enough to stretch their skills. Control is a transition channel between flow and relaxation. There are not many cases where you would aim for the control channel, but it is predicted by high perceived skills and average perceived challenges.

Arousal is the uncomfortable experience of being pushed beyond what we believe we are capable of that forces us to grow our capabilities to meet the challenges we face. Arousal is good for learning and good for people who like to push themselves beyond their comfort zone. But being outside our comfort zone is by definition uncomfortable. If your stakeholders want to push users beyond their capabilities, arousal is the target experience. That means your target is high perceived challenges and only average perceived skills to meet them.

The boredom, anxiety, worry, and apathy channels of experience are all various shades of bad news. When users experience low challenges and average skills to face them, they are in the boredom channel. High challenges and low skills to face them, they are overwhelmed and in the anxiety channel. Low challenges with average or low skills to face them leads to worry or apathy.

Share this white paper:

Step 2: Choose baselines for comparison

For each task or scenario the user will face, identify if the intended experience is engagement, control, relaxation, or painfully fast learning. Meet with your stakeholders and work with them to come to agreement on the intended moment-to-moment user experience.

To make it simpler, you can ask if each part of the experience is supposed to be activity (flow), rest (relaxation), or uncomfortably fast learning (arousal) and just leave out control unless they want something between flow and relaxation. A hotel booking website, for example, could aim for flow while searching for a hotel and relaxation while booking the room. This means high challenge is better for the search while low challenge is better for the booking experience.

If there is an existing version of the design, it may also help to identify which of the channels of experience they feel the current design is giving users. Show your stakeholders the Experience Fluctuation Model and get their opinion. Even if their opinion doesn't turn out to be accurate, it makes the executive intent clear - they want the redesign to take it from boredom to flow, or from anxiety to relaxation, for example.

Step 2: Choose baselines for comparison

Having numbers to compare the scores that you get helps put them into context. Baselines give us a point of reference. There are two good baselines for comparison: competitors' designs and previous versions of your designs.

Testing competitor's designs is sometimes called benchmarking. If participants are randomly assigned to be either in study of the competitor's design (control) or the study of your design (treatment), with participants having an equal chance of being in either study, you've got an experimental study design - technically an unblinded randomized control trial.

Iterative testing and redesign allow us to show how the current design compares with previous versions of the design. Showing how the user experience changes as the design evolves throughout the design process is the best practice because it is specific to your design and therefore more directly comparable. Still, more points of reference are helpful.

Share this white paper:

Steps 3 and 4: Gathering and analyzing data

Step 3: Gather Data

After participants complete each task or scenario during the usability test, we gather data with the Flow Condition Questionnaire (See Appendix, page 19). The FCQ assesses how well the design has met the 7 flow conditions. In cases where navigation is not involved, the Clear Navigation Goal question can be dropped.

Follow each FCQ with a brief interview to understand what it was about the design that led to their answers. These qualitative data can give us critical insights into how we can improve the design and make it more likely to lead to the intended user experience.

The target experience for each task should be kept in mind during these brief follow-up interviews, but not shared with participants to avoid biasing them. The target experience only affects how we interpret and value the challenge and skill conditions – we always want the others to be high. Our goal is to explore how well the current user experience fits the intended experience, what elements of the design support the intended experience, and what elements need to be improved.

The follow-up interviews can draw our attention to problems with the design - usability problems as well as problems preventing the flow conditions from being met. But it is important to keep in mind that the participants' understanding of the cause or solution of the problem may not be correct. So it is up to us to figure out what the problem is and how it can be improved.

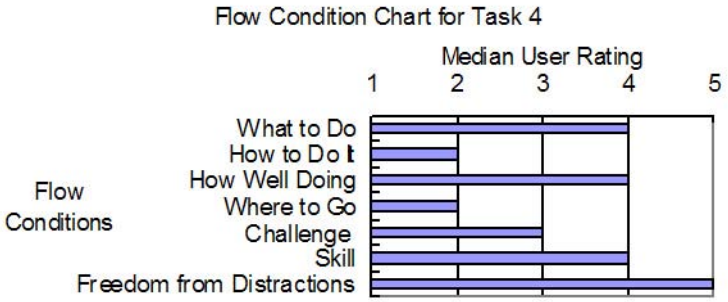
Step 4: Analyze data and apply insights of the data gathering to redesign

The most important part of engineering designs that foster flow is taking the task-level qualitative data about what elements of the design fostered or undermined flow and applying that feedback to the redesign. This is how the Flow Condition Questionnaire (FCQ) helps us improve designs.

Share this white paper:

Step 5: Iterate, Iterate, Iterate

Most of the number crunching is just directly comparing descriptive statistics – frequency charts and median scores. For each user task, chart the median rating of each flow condition across participants. This highlights which flow conditions need the most improvement for each task:



Sample Flow Condition Chart

If you want to compare the results from your study with the results from a previous version of the design or with a benchmarking study of a competitor, it's better to use a U test (also known as the Wilcoxon-Mann-Whitney test) to compare median scores, the non-parametric version of the t-test.

Step 5: Iterate, iterate, iterate

Begin the process again, with the results from the previous study as another baseline. Iterative (repeated) cycles of testing and redesign are the best practice for continuous improvement.

If you find obviously needed changes, make them! That way you can begin testing the improved design. There's even a usability testing method that came out of Microsoft's games user research lab where changes are made after rounds of just 1-3 participants.Even if the changes create new problems, it is better to find that out sooner rather than later so a better solution can be found.

Share this white paper:

This sounds very relevant for Business-to-Consumer (B2C) designs, but is flow relevant for Business-to-Business (B2B) systems?

Of course! More than that, flow is relevant for designing any human activity to be more motivating and enjoyable. Company buyers are still human beings, and keeping them motivated and engaged while they are purchasing raw materials is not that different from keeping customers motivated.

Use the Flow Condition Questionnaire to engineer designs that are more fun to use.

We were just doing a project for a major steel manufacturer in China. Their main customers are buyers from other businesses. So their users may have more expertise in their domain, but they are still human beings and still motivated by enjoyment. The price negotiation design we suggested was very well received because it turned the challenge of finding a price the buyer and seller could accept into a source of flow, creating a kind of haggling game.

Designing for flow is also important for internal business applications, like a system used by bank tellers or people working in a call center. Finding meaningful challenges and getting clear feedback about progress on those challenges is the best way to make even boring or repetitive work more like an enjoyable game. The FCQ helps us focus on these flow conditions so we can create designs that make work more fun.

Imagine sitting in a call center, on the phone 8 hours a day, on the same kind of call again and again. Of course you'll be less frustrated if the system you're using is quick and easy to use. So usability is still important. But to get you engaged and motivated, the system you're using has to make your work more fun: the design needs to facilitate flow.

What's the main point you want everyone who reads this to remember?

Using the Flow Condition Questionnaire, we can engineer designs that are more fun to use because they get users into flow.

We have to go beyond making things easier to use. Let's make things fun to use.

Share this white paper:

References

Csikszentmihalyi, M. (1975). Beyond Boredom and Anxiety: The Experience of Play in Work and Games. San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1988). Optimal Experience. Cambridge, UK: Cambridge University Press.

Csikszentmihalyi, M. (1990). Flow: The Psychology of Optimal Experience. New York, NY, US: HarperCollins Publishers.

Csikszentmihalyi, M. & LeFevre, J. (1989). Optimal Experience in Work and Leisure. Journal of Personality and Social Psychology, 56, 5, 815-822.

Csikszentmihalyi, M. & Nakamura, J. (2010). Effortless Attention in Everyday Life: A Systematic Phenomenology . In Bruya, B. (Ed.), Effortless Attention. (pp. 179-190). Cambridge, MA: MIT Press.

Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. Journal of Personality and Social Psychology, 18, 105-115.

Deci E. L. & Ryan R. M. (1985). Intrinsic Motivation and Self-Determination in Human Behavior. New York: Plenum Publishing.

Delle Fave, A., Massimini, F., Bassi, M. (2011). Psychological Selection and Optimal Experience Across Cultures: Social Empowerment through Personal Growth. Heidelberg, Germany: Springer Science+Business Media.

deVries, M. W. (Ed.) (1992). The Experience of Psychopathology: Investigating Mental Disorders in Their Natural Settings. Cambridge, MA: Cambridge University Press.

Hektner, J. M., Schmidt, J., & Csikszentmihalyi, M. (2007). Experience sampling method: Measuring the quality of everyday life. Thousand Oaks, CA: Sage.

Nakamura, J., & Csikszentmihalyi, M (2002). The Concept of Flow. In Snyder, C. R., Lopez, & Shane J. (Eds.), Handbook of Positive Psychology (pp. 89-105). New York: Oxford University Press.

Nakamura, J., & Csikszentmihalyi, M. (2009). Flow theory and research. In S. J. Lopez & C. R. Snyder (Eds.), Handbook of positive psychology (2nd ed., pp. 195-206). New York: Oxford University Press.

Share this white paper:

References

McGonigal, J. (2011a). Reality Is Broken: Why Games Make Us Better and How They Can Change the World. London: Penguin.

McGonigal, J. (2011b). We Don't Need No Stinkin' Badges: How to Re-invent Reality Without Gamification. Serious Games Summit, Game Developers Conference. Retrieved from: http://www.gdcvault.com/play/1014576/We-Don-t-Need-No April 1st, 2013.

Medlock, M.C., Wixon, D., Terrano, M., Romero, R., Fulton, B. (2002). Using the RITE method to improve products: a definition and a case study. Proc. Usability Professionals Association (Orlando FL, July 2002).

Pagulayan, R. J., Keeker, K., Fuller, T., Wixon, D., Romero, R. (2008). User-centered design in games. In A. Sears and J. Jacko (Eds.), The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications (2nd ed., pp.741-759). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Share this white paper:

About Owen Schaffer

Owen Schaffer, MA, CUA
Lead Usability Analyst
Human Factors International

Owen Schaffer is an expert in user research, applying psychology and human-computer interaction research to making designs more engaging, usable, and enjoyable.

He received his Master's in Positive Organizational Psychology and Evaluation from Claremont Graduate University. He studied positive psychology and flow with Mihaly Csikszentmihalyi, co-founder of the field of positive psychology and author of *Flow: The Psychology of Optimal Experience*. Working with Csikszentmihalyi, he developed measures of flow and the conditions that get players into flow.

Owen has taught advanced Human Computer Interaction (HCI) training courses in the Certified User Experience Analyst (CXA) Series, such as, *How to Design for Persuasion, Emotion, and Trust (PET)*. He has presented at conferences and universities, including Peking University, UX Week, and the Top 100 case study conference.

He has lived in Canada, India, and Japan, and is now living in China.

Share this white paper:

Flow Condition Questionnaire (FCQ)

Owen Schaffer

Please indicate how much of the time you knew each of the following while you were doing the activity by marking one circle for each question.

How much of the time did you know…?

	Never		About half of the time		Always
what to do next	○	○	○	○	○
how to do what you were doing	○	○	○	○	○
how well you were doing	○	○	○	○	○
where to go next	○	○	○	○	○

Please answer the following questions about how you felt **while you were doing the activity** by marking one circle for each question.

	Not at all				Very much
How challenging did this activity feel?	○	○	○	○	○
How much did you feel able to overcome the challenges you faced?	○	○	○	○	○
How distracted were you from what you were doing?	○	○	○	○	○

Scoring

Reverse the score of the last question to get Freedom from Distractions. The items above are in the following order: Clear What to Do, Clear How to Do it, Clear How Well Doing, Clear Where to Go, Challenge, Skill, and Freedom from Distractions.

Human Factors
International

410 West Lowe, P.O. Box 2020
Fairfield, IA 52556
Phone: 800.242.4480
Fax: 641.472.5412
hfi@humanfactors.com
www.humanfactors.com

© 2013 Human Factors International, Inc.