FRONT-END PROTOTYPING PLANNING TOOL

The front end of design is critical for product success. It includes activities such as problem identification, problem definition, requirements and specifications development, and concept generation and development. Prototypes can play important roles in front-end design work, but historical emphases on prototype use in design have been for supporting back-end design activities. This Front-end Prototyping Planning Tool was developed from research on practitioners' use of prototypes in front-end design work to support designers in thinking about how to intentionally use prototypes to engage stakeholders during front-end design.

To use this Front-end Prototyping Planning Tool, start with the design question in the middle of the diagram. It is up to you to determine which section to complete next. For example, you might have an interest in engaging a particular stakeholder type or you might have prototypes that you have already created that you want to use. Follow the prompt in that section, and then complete the additional sections (the order in which you do this is your choice). Be intentional in your planned approaches. After all of the sections are completed, review them to ensure that there is alignment across sections, and revise as necessary.

Repeat the process of filling out the form for each of your front-end design questions. Refer to the next page for examples of types of stakeholders, prototypes, and strategies.

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STAKEHOLDERS

Which stakeholder(s) or stakeholder group would be best suited to answer your front-end design question?

FRONT-END DESIGN QUESTION

What do you need to know in order to move forward?

START HERE

PROTOTYPES

What prototype(s) would allow you to answer your front-end design question?

STRATEGIES

Select one or more strategies to answer your front-end design question.

Describe how you will leverage the strategy (or strategies) by considering the following questions.

- How will you prepare for interacting with the stakeholder(s)?
- How will you frame the interaction with the stakeholder(s)?
- How will you introduce your prototype(s)?
- How will you engage with the stakeholder(s)?

FRONT-END PROTOTYPING

Prototypes are representations of design ideas and are tools that can be leveraged at multiple design process stages, including during the front end of design to engage stakeholders.

PROTOTYPES

2-D

- Drawing
- Engineering Drawing
- Photo of a physical prototype
- Rendering
- Storyboard

PHYSICAL 3-D

- Existing product
- Near-final materials prototype
- Pilot
- Test materials prototype

DIGITAL 3-D

- CAD Model
- Interactive rendering
- Video of a physical prototype

STAKEHOLDERS

USERS

- Active user
- Passive user
- Proxy user
- Use-cycle stakeholder

EXPERT ADVISORS

OTHER STAKEHOLDERS

- Community partner
- Customers
- Financial decision maker
- Government and regulatory
- Manufacturing stakeholder
- Marketing stakeholder
- Supply chain stakeholder
- User influencers

REFERENCES

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Rodriguez-Calero, I.B., Daly, S.R., Burleson, G., Coulentianos, M.J., Sienko, K.H. (2021) Using practitioner strategies to support engineering students' intentional use of prototypes for stakeholder engagement during front-end design. Clive L. Dym Mudd Design Workshop.

Rodriguez-Calero, I. B., Coulentianos, M. J., Daly, S. R., Burridge, J., & Sienko, K. H. (2020). Prototyping strategies for stakeholder engagement during front-end design: Design practitioners' approaches in the medical device industry. Design Studies, 71, 100977.

STRATEGIES

Brief the stakeholder about the project and the prototype(s) shown
Introduce the stakeholder to the project, describe the prototype(s), and describe participation expectations

Encourage the stakeholder to envision use cases while interacting with the prototype(s)
Prompt the stakeholder to imagine how they would use the prototype in use cases

Have the stakeholder interact with the prototype(s) in a simulated use case
Replicate relevant conditions of the product's environment of use in a simulated setting

Introduce the prototype(s) to the stakeholder in the use environment
Place the prototype in its environment of use when engaging the stakeholder

Lessen a prototype's refinement when showing it to the stakeholder
Engage the stakeholder with less sophisticated or complete prototypes than the current project status

Make prototype extremes to show the stakeholder
Exaggerate prototype characteristics with specifications at their upper or lower limit, or opposite characteristics

Modify the prototype(s) in real time while engaging the stakeholder
Make changes to the prototype(s) while the stakeholder is present (designer as main actor)

Observe the stakeholder interacting with the prototype(s)
Prompt the stakeholder to interact with prototypes while observing the interaction

Polish the prototype(s) shown to the stakeholder
Create or modify a prototype to more closely resemble the final form versus the current status of the project

Present a deliberate subset of prototypes to the stakeholder
Present fewer, carefully selected prototypes to the stakeholder than the full set of prototypes created

Prompt the stakeholder to select prototypes and prototype features
Ask the stakeholder to choose or prioritize ideas based on provided prototypes

Reveal relevant information to the stakeholder specific to the prototype or its use
Strategically reveal relevant information, leaving out details about e.g., functionality or rationale

Show a single prototype to the stakeholder
Engage the stakeholder using one prototype

Show the stakeholder additional prototypes to supplement a prototype of the same concept
Engage the stakeholder using storyboards, test data, computational models, materials, physical models, etc. to elaborate on the details of the prototype.

Show the stakeholder multiple prototypes concurrently
Prompt the stakeholder to compare options using multiple prototypes.

Task the stakeholder with creating or changing the prototype(s)
Prompt the stakeholder to create or modify the prototype(s) (stakeholder as main actor)

Standardize the refinement of prototypes shown concurrently to the stakeholder
Present prototypes that are at the same level of refinement when shown simultaneously to the stakeholder