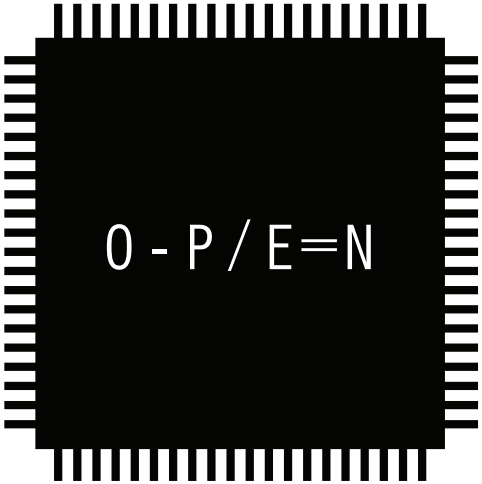
DESIGN#CODE



Strategy expressed as design
Design expressed as code

An introduction to design#code
for Boeing Commercial Aviation Services
July 2013

What is design#code?

design#code is a system for developing breakthrough solutions in the form factor of services: Delivering superior sets of outcomes and experiences at better prices, without the false choices or compromises that corrode customer value and erode margins.

Industrial design for the form factor of services

When customers buy a service, they expect value to materialize in the form of a particular set of outcomes and experiences at a particular time and place. Outcomes are the material value of a service; experience is the packaging. Design reduces the risk the expected value fails to materialize. Good design creates unexpected value by delivering superior outcomes and experiences at a lower total cost of utilization i.e. the price/experience ratio.

Outcomes – Price/Experience = Net Value, or O-P/E=N

Good design, fast™

design#code combines the tradition of industrial design with the tradecraft of strategy, to generate superior designs in fast cycles. A pair of design canvases embed a sophisticated design logic, based on economics, industrial engineering and organization science. Like spreadsheets for service design, when complete, the canvases passively generate the design of a service product, in the form of an instruction set or pseudo code, that teams can implement. Encoded in design are the service provider's business model and strategy.

Raising the bar by lowering the barriers™

While an iron logic ensures the design is neither simplistic not superficial, filling the canvases with ideas, observations and insight can be as simple as having a whiteboard discussion, a friendly chat or a spirited argument at a table. design#code makes it easy to truly engage stakeholders in the design effort with a parallel and asynchronous mode that allows them to contribute whatever they can, whenever they can, with spontaneity and speed, without necessarily being present at the same place or at the same time. The collective know-how; divergent perspectives; and competing ideas on how best to deliver a particular set of outcomes and experiences, lead to superior service products without design flaws engendered by groupthink.

What can Boeing do with it?

Develop an unfair advantage over rivals in the market for commercial aviation services.
Develop service products that define, evolve and dominate uncontested market spaces in which nobody else can better fulfill the needs of airlines and other customers, or more profitably.

- Find and explore the potential for entirely new services defined by emergent or underserved customer needs; quickly develop and test hypotheses based on a particular business model or strategy.

- Strengthen and harden the core value of existing service products, preemptively or in response to challengers; make changes to the "code" to make the service product hardier and more resistant to industry factors.

- Find and eliminate hidden costs and risks that sabotage customer value but are invisible to traditional problem-solving methods; use design as a forensic tool to examine evidence of major failures.

design#code combines the tradition of industrial design with the tradecraft of strategy. It is particularly suited for business services, which present additional challenges relative to consumer services:

- Customers are distinct and separate from users; what customers want may conflict with what users expect. Good design creatively resolves any conflict between outcomes and experience without compromise.

- Several parties coordinate the delivery of a particular set of outcomes and experiences from which value will materialize; single operating theater with dependencies while maintaining different positions and points of view.

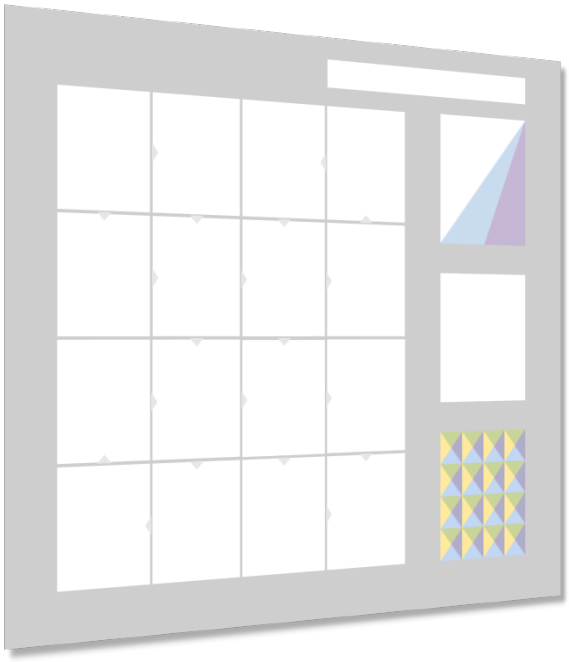
- Customer interactions are far more complicated than in consumer retail spaces, such as car washes, banks or restaurants; the engagement of customer assets in their operating environment on their terms & conditions

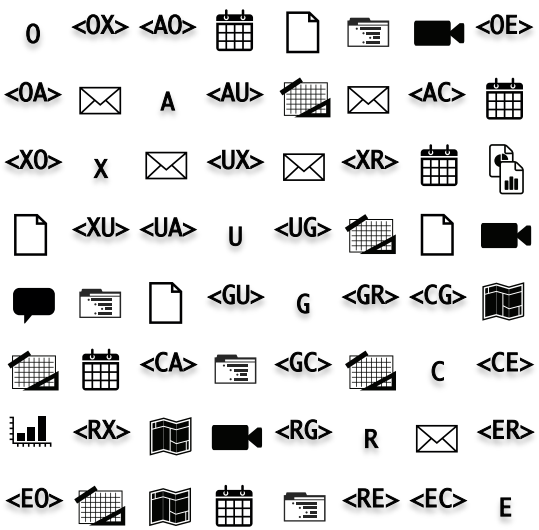
design#code is sophisticated enough to handle the most complex of business models because of a system of framing and encoding value propositions based on customer outcomes.

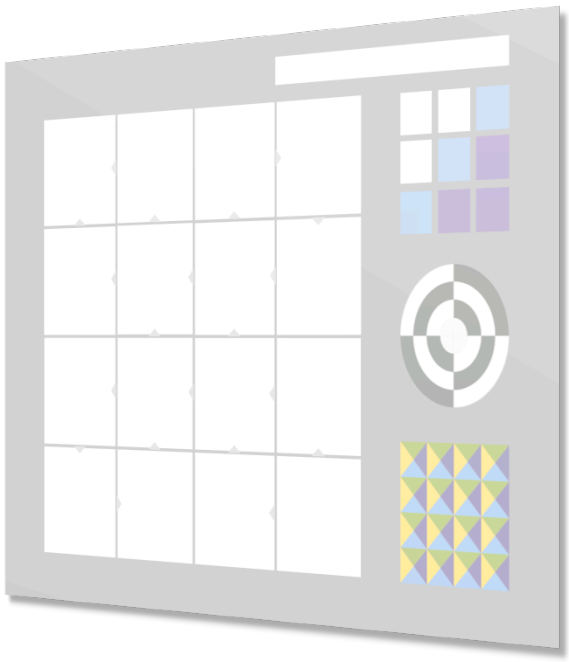
EXHIBIT 1

Canvas + content + code

2 Design Canvases. 8 Design Perspectives. 12 Design Arguments. 32 Design Functions.
Each canvas has 16 design functions in a 4x4 grid of interlocked panels. Each design function







UNFOLD **CANVAS**
For defining the service concept from the customer's perspective

CONTENT + CODE
Ideas, observations & insight encoded by the embedded logic of the canvases

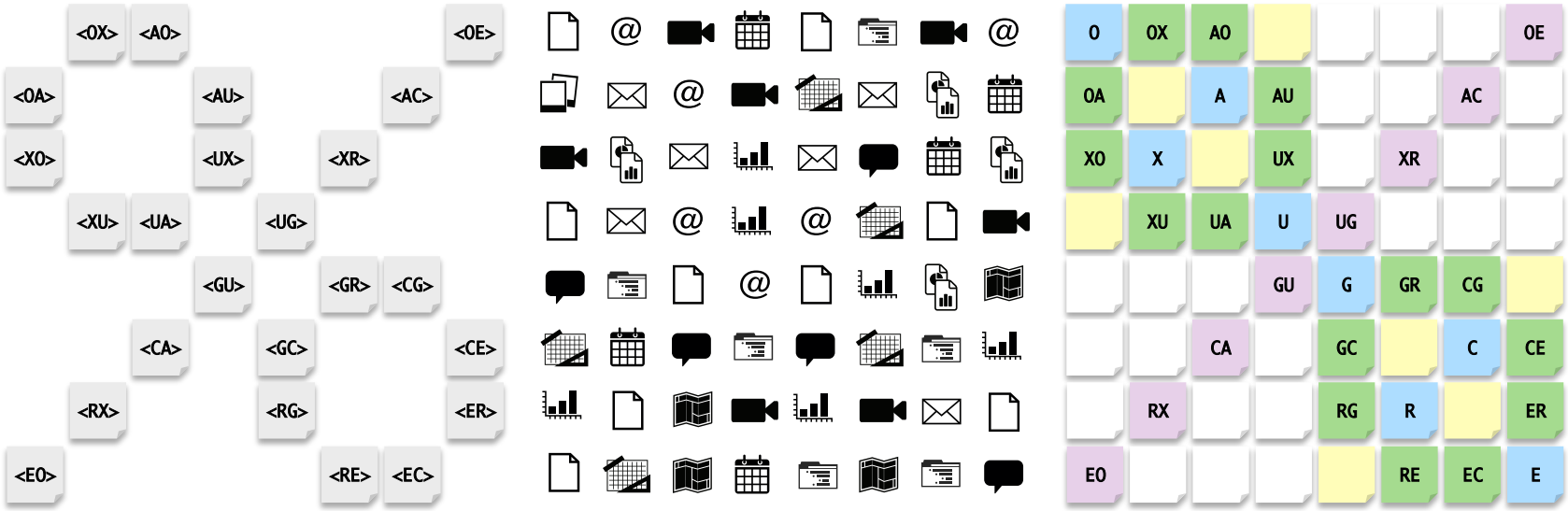
FOLD **CANVAS**
For defining the service product from the provider's perspective

EXHIBIT 2

From punched cards to Post-It Notes®

Not everyone could program with punched cards. We can all program with Post-It Notes®

Engaging stakeholders in the design effort with spontaneity and speed.



Design Arguments

There are two sides to each argument: The customer and provider perspectives.

Design Input

Ideas, observations and insight, as and when they occur, to who them occur.

Design Functions

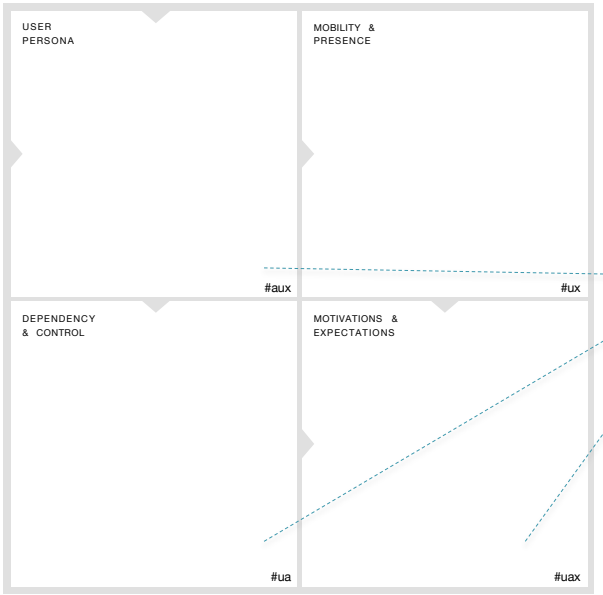
There are two sides to each argument: The customer and provider perspectives.

design#code is a programming language of sorts for defining the behavior of the various organizational systems and structures that deliver and support a service; much like software code represents a single and definitive set of instructions for all parts of a computer system to execute on with zero ambiguity. An elegant system of functions and arguments is used to process design input (canvas content) into meaningful information on one or more aspects of a service design. This allows design input to be accepted in a wide variety of forms and format, such as text, images, digital recordings, documents and artifacts; from several different sources. The content is tagged with one or more design arguments depending on its placement on the design canvases.

EXHIBIT 2B

Raising the bar by lowering the barriers™

TEXT
DOCUMENTS
DRAWINGS
SKETCHES
NOTES
MESSAGES
PHOTOS
VIDEOS
MAPS
CHARTS
WORKSHEETS
MEMOS
REPORTS
COMPLAINTS
ETC.



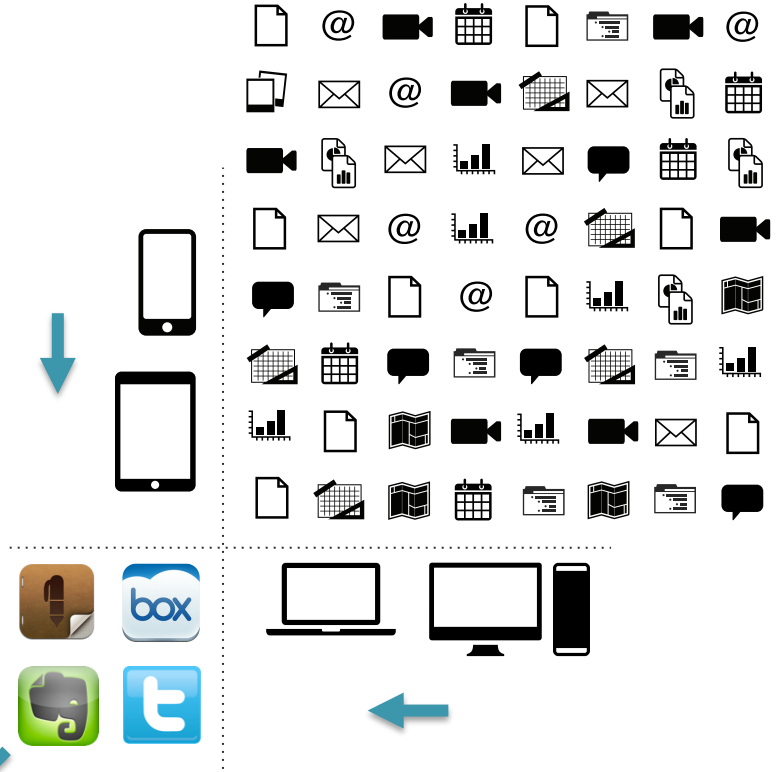
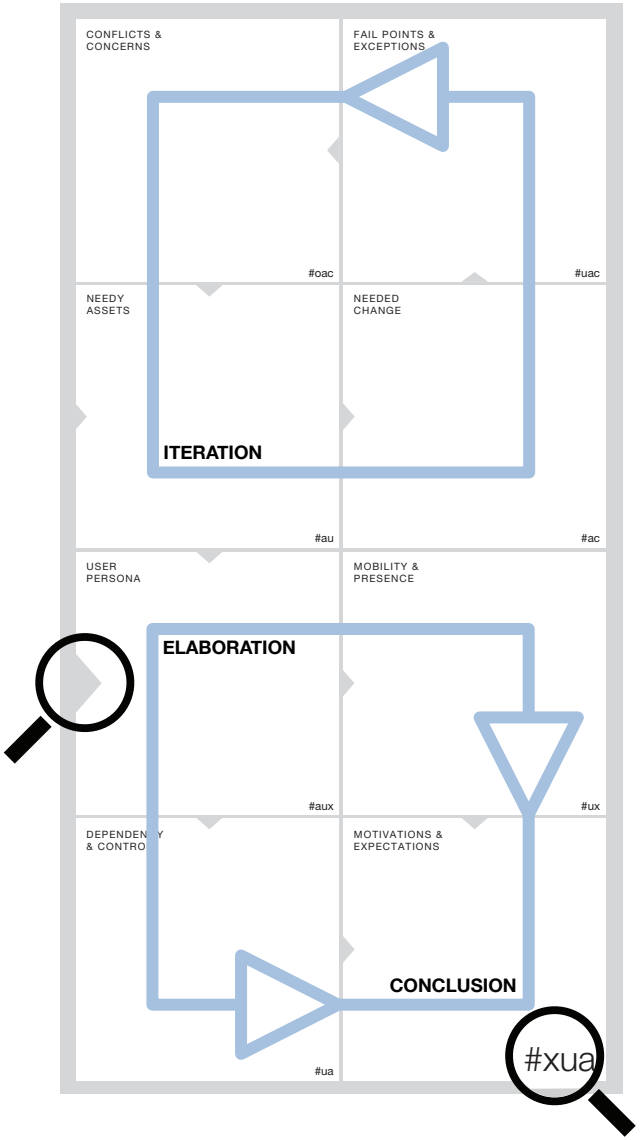


EXHIBIT 3

Service Logic

The difference between breakthrough design you can actually implement, and just a bunch of ideas scattered

Brainstorming and ideation sessions are notorious for giving sponsors a false sense of hope; participants a false sense of contribution; and managers a false sense of accomplishment



Teams can work asynchronously and in parallel, building progressively faster on each piece of input, as the albums accumulate content. Even when they're working "off-canvas" participating stakeholders are contributing to the Big Picture design on the canvas. The interlocked canvas panels readily integrate multiple lines of thought, work streams, and perspectives.

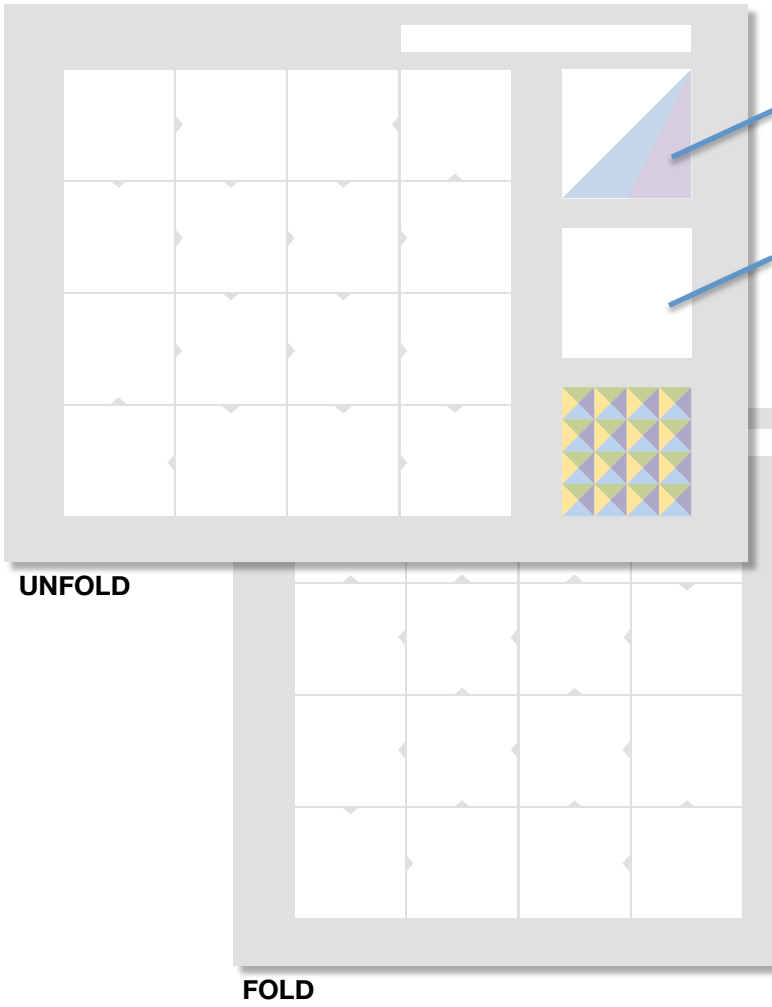
While, participants in a design effort may place their ideas, observations and insight anywhere on the canvas the single thread of logic running across the two canvases, forces the team to elaborate, iterate and draw conclusions on that input. (There is a great story on how the CATIA CAD/CAM system helped identify design conflicts between two teams working in parallel on the wing and fuselage sections of the Boeing 777 jet).

The interlocks help identify conflicts; force discussions; provide multiple paths across the canvas to prevent deadlock; and allow teams to fill each other's blind spots.

EXHIBIT 4

The canvases are embedded with tools for analyzing, framing, and encoding design

The core design logic embedded in the interlocked panels of the canvas is complemented by a set of tools to prioritize customer needs, set design objectives, maintain focus, and ensure the quality & integrity of design before encoding it.



OPPORTUNITY MAP For ranking customer needs based on the importance of outcomes and fulfillment levels, so that the design effort is biased towards most under-served needs.

STORY BOARD For stories about customers and users that illustrate the use of the service and provide clarity and insight into why, when, where, how and for who the service the service will create value; and why customers will pay for it

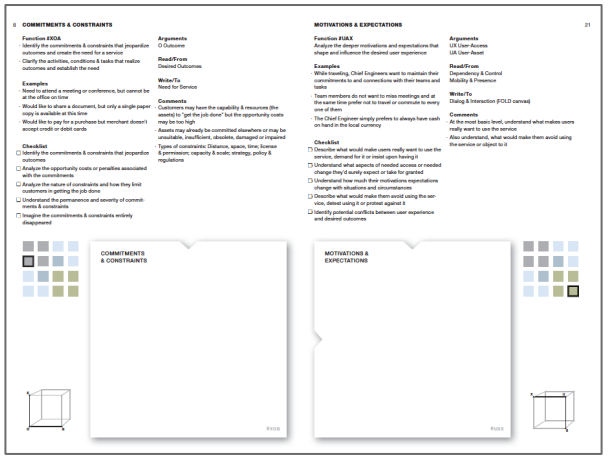
CROP CHART For harvesting service offerings from a design packaged based on hierarchy of needs and segmentation of customers by outcomes and experience

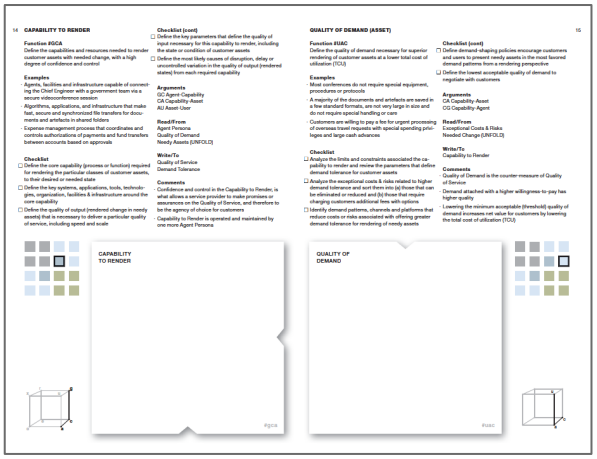
O/E CURVES For analyzing trade-offs between customer outcomes and user experiences; to optimize the TCU and maximize the net value from the service

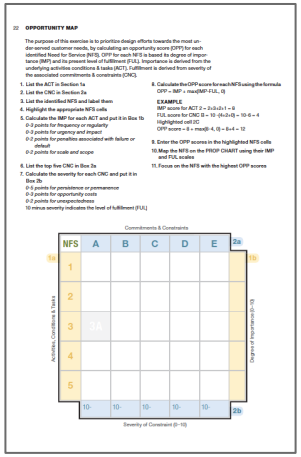
ENCODER For encoding the business model and strategy associated with the design; and to maintain the quality and integrity of design in across time.

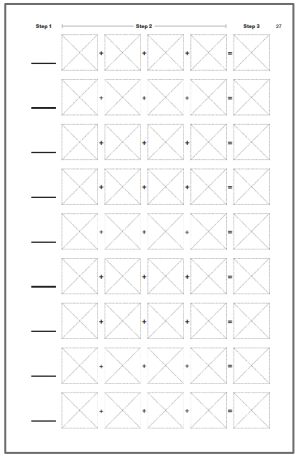
EXHIBIT 5

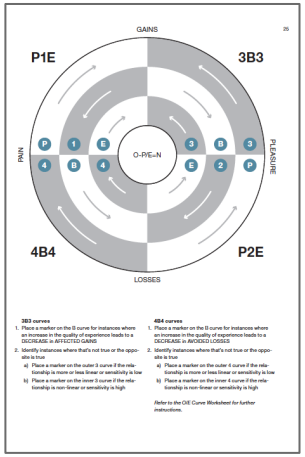
Checklists!











Nobody understands the value of checklists better than Boeing.

Hard problems with high stakes often call for very sophisticated design of complex systems, so they can simply work.

Because of the problem space design#code has itself been designed for, the canvases each come with user manuals with function definitions, guidelines and checklists.

The manuals also include worksheets and templates using which teams can gather input, analyze the design and make sound decisions.

EXHIBIT 6

Sample output of a design exercise

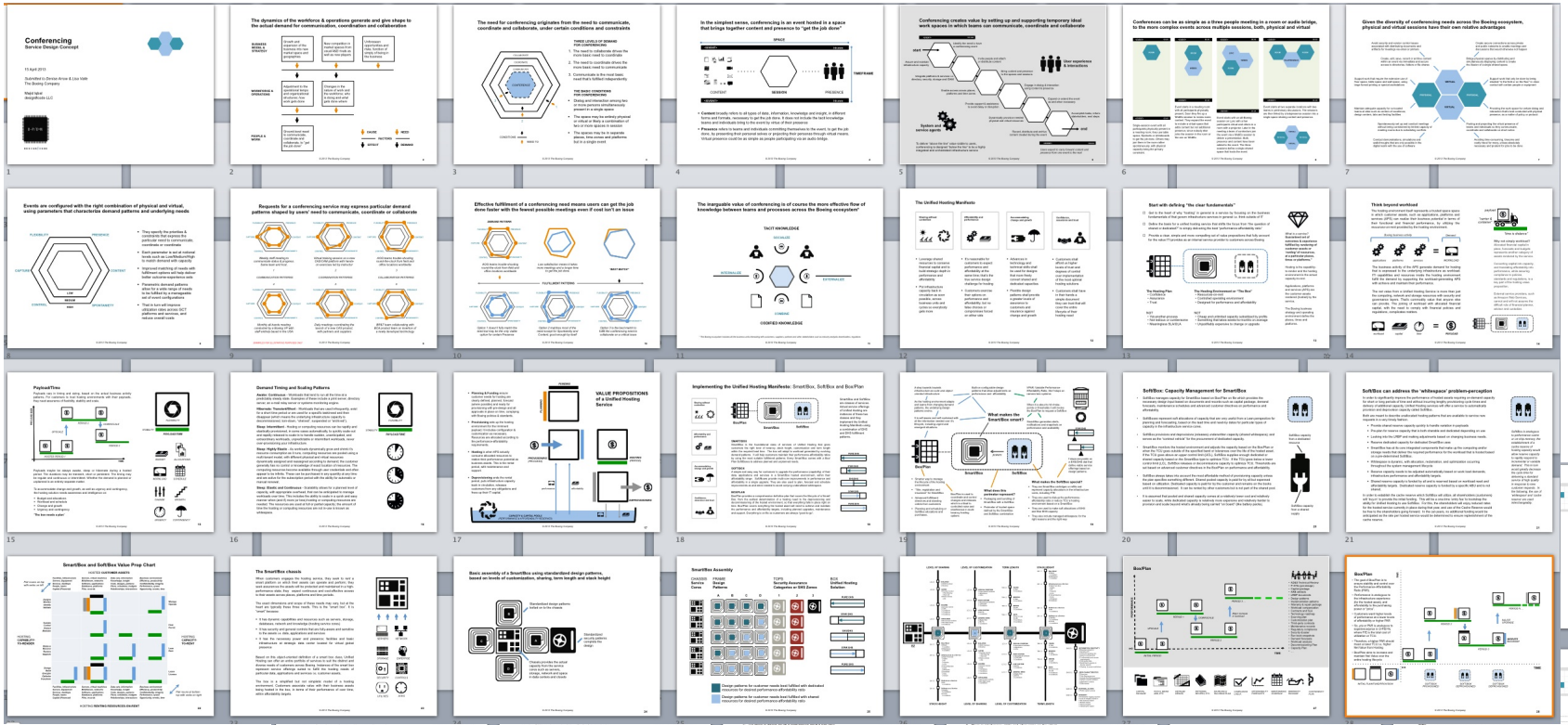
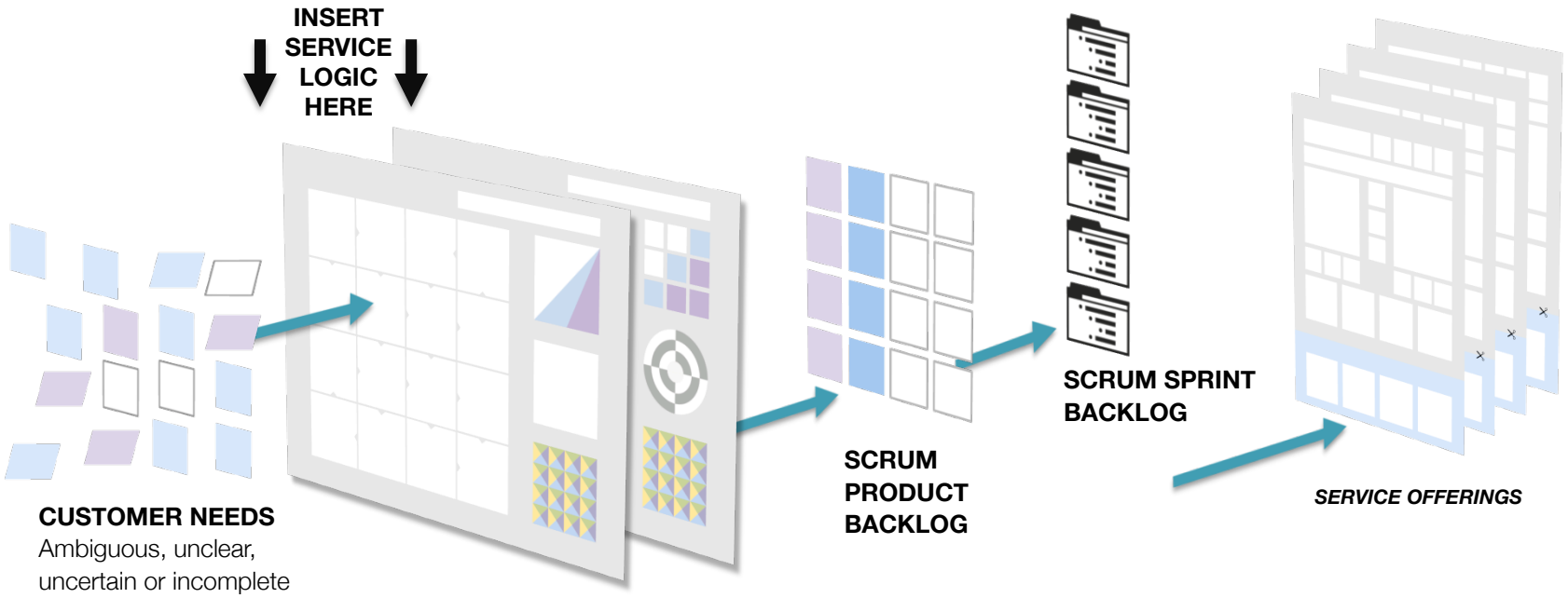


EXHIBIT 7

Design as code

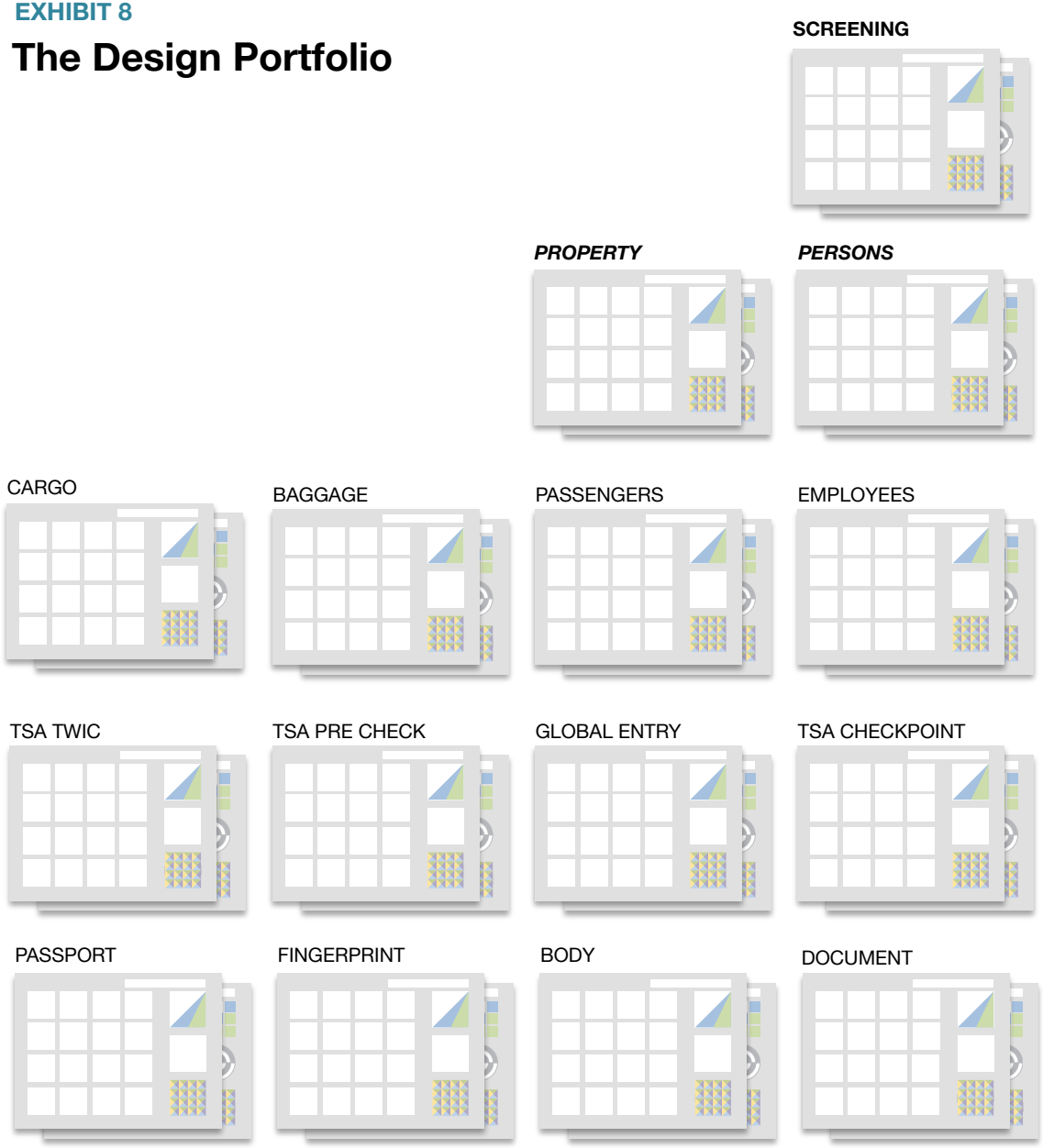
design#code is like *source code* for the service enterprise, to coordinate and control tasks and teams across the organizational layers and technology stacks. In the era of software-as-a-service, design#code provides a much better way for product managers to communicate requirements and manage expectations during a software development project.



For example, software teams would be working off the same *design code* as data center specialists to calibrate the performance of applications; technical support teams know what incidents and problems to expect; information architects and UX designers will design interactions that harmonize experiences with outcomes; and third-party services integrate seamlessly into the solution, all because everybody's literally on the same page.

EXHIBIT 8

The Design Portfolio



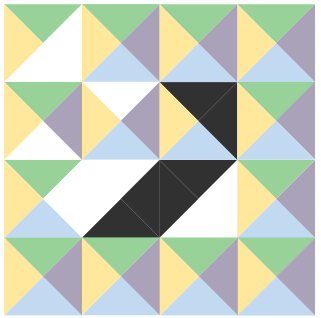
Design as code allows for an entire portfolio of services to be encoded with a particular business model and strategy.

Services offerings inherit and share design DNA, so that policy and strategy are consistently enforced across the portfolio of services.

Propagation of innovative ideas, fixes to problems, and technology insertion becomes much easier.

The Screening mission of the Department of Homeland Security is shown as an illustrative example of a service portfolio.

Design DNA



Notes

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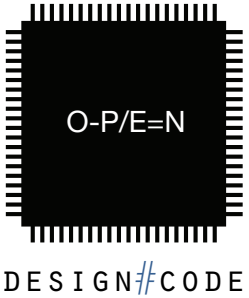

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