House of Quality with Decision Matrix_Video Script

This instructional based video content includes utilizing the house of quality to determine the final design concept this tool is found in your DMADVR toolbox and it is also a tool under the auspices of quality function deployment. The benefit of the quality function deployment or house of quality matrix is that is going to give your team a method to help you make a decision about which one of your concepts is going to be the best we're going to spend some time in this video talking about what's actually going on in the decision matrix and how to interpret the information based on the data that you've provided within the house of quality we're going to utilize the market area of the house of quality beneath that area. We're going to see there's a meets requirements area and we'll take a look at that layout in the house of quality in just a second and I'll show you more specifically where these areas are in the house of quality the decision matrix is right under this area and the data that you insert there.

will help you to tell which one of your concepts is meaning your customer

0:00:58.590,0:01:03.750
requirements the most or the best ideally we will have one concept that

0:01:03.750,0:01:07.229
will stand out above the rest by showing at least a ten percent higher value of

0:01:07.229,0:01:11.490
ranking than the remainder of the concepts we can look at combination some

0:01:11.490,0:01:15.540
concepts and maybe take the best of the best of those and combine them to come

0:01:15.540,0:01:20.729
up with yet another concept an optimized concept there's a tool also that you can

0:01:20.729,0:01:26.580
use morphological matrix or chart that can help your team to generate ideas to

0:01:26.580,0:01:30.570
meet different customer requirements as the need arises a morphological chart or

0:01:30.570,0:01:35.070
matrix can help you to determine other ways to improve the way you're meeting

0:01:35.070,0:01:40.350
your customer requirements let's review what we did with the house of quality to

0:01:40.350,0:01:44.700
begin with we started out by stating and overall function or objective that our

0:01:44.700,0:01:49.320
customer wants us to meet in our design we define that those criteria and those

0:01:49.320,0:01:53.130
requirements will be embedded in to our design and then we started doing some

0:01:53.130,0:01:56.939
research we started to look for benchmarks from our competitors maybe

0:01:56.939,0:02:00.149
you even get to the point where we're
ready to simulate a design and start

0:02:00.149,0:02:04.350
generating data with a math mode. We're at the point when we need to start

0:02:04.350,0:02:08.729
considering design concepts and options
we want to do the best job you can and

0:02:08.729,0:02:12.239
fulfilling our customers requirements
and meeting the recruiter as best we can

0:02:12.239,0:02:15.940
so we need some tools
show us what concepts are doing the best

0:02:15.940,0:02:20.590
at that in what concepts we may want to
strengthen by changing some of the

0:02:20.590,0:02:25.030
engineering specifications what we're
after by using this tool the house of

0:02:25.030,0:02:29.320
quality tool and the decision matrix is
to optimize or maximize our decision

0:02:29.320,0:02:33.310
outcomes by the choices of the
engineering specifications that were

0:02:33.310,0:02:37.870
required in order to meet the
competitors benchmarks here is the house

0:02:37.870,0:02:41.320
of quality in the area that we're
interested in is the area to the right

0:02:41.320,0:02:46.780
in where it says markets on the left
side it says competition and the right

0:02:46.780,0:02:51.580
side says our concepts meet customer
requirements is the degree to which our

0:02:51.580,0:02:55.120
competitors are meeting these customer

requirements remember these are all the

0:02:55.120,0:02:59.200
critical to quality parameters as set
forth by the customer these are the

0:02:59.200,0:03:02.560
things our customer told us they wanted
to see on our design and as an engineer

0:03:02.560,0:03:06.190
we need to come up with these
engineering specifications or parameters

0:03:06.190,0:03:11.410
that will be embedded into our design to
meet the requirements this area also

0:03:11.410,0:03:14.950
speaks to how competitors are
meeting each of those customer

0:03:14.950,0:03:19.240
requirements as well so in this area
will rank the competition in terms of

0:03:19.240,0:03:24.220
their ability to meet the requirements
and rank them 1,2,3,4 and

0:03:24.220,0:03:29.230
so forth we also want to do the same for
our concepts you want to see how each of

0:03:29.230,0:03:32.740
our concepts is doing it meeting each of
these customer requirements by ranking

0:03:32.740,0:03:36.550
them accordingly when we get through
with this process of ranking our

0:03:36.550,0:03:40.060
competition and their ability to meet
all the customer requirements we will

0:03:40.060,0:03:43.570
want to look at this area down below
which is where the decision matrix

0:03:43.570,0:03:48.610
results are being stored in the green
area below those results will tell us

0:03:48.610,0:03:52.120
which of our concepts is standing above
the other and which of our competitors

0:03:52.120,0:03:57.340
is also standing above the others we
actually have hard data down here where

0:03:57.340,0:04:02.050
we'll be recording specific quality
quantities related to our competitors

0:04:02.050,0:04:07.480
and related to our own concepts here's
an example of where we've got our

0:04:07.480,0:04:11.350
concepts and there are four of them
we've come up with on the right side

0:04:11.350,0:04:15.040
here so there's our competition and then
there's our concepts that we've

0:04:15.040,0:04:19.090
established and we're trying to improve
or to meet we are trying to improve in

0:04:19.090,0:04:23.140
order to meet or exceed our competitors
for the purpose of trying to capture a

0:04:23.140,0:04:27.610
particular market segment here we have a
color code and for the competitors we

0:04:27.610,0:04:33.129
one green the 2560 value for this
particular competitors product and then

0:04:33.129,0:04:38.169
on the low end of the competitors we
have the 1947 value in red the green one

0:04:38.169,0:04:41.590
will be the lead competitor so this
competitor is doing a better job at

0:04:41.590,0:04:45.729
embedding those customer requirements in their products then say other

0:04:45.729,0:04:50.259
competitors now with regard to our
concepts this one actually shows a great

0:04:50.259,0:04:53.800
deal of promise because we're actually
exceeding anything that the competition

0:04:53.800,0:04:57.460
does here and our remaining three
concepts are well within ten percent of

0:04:57.460,0:05:02.099
our best the decision matrix will turn
the cell red if that value falls below

0:05:02.099,0:05:07.479
ten percent threshold of the best
concept so these three concepts are

0:05:07.479,0:05:11.020
within ten percent of the same value of
our lead so we may want to look at

0:05:11.020,0:05:14.979
combinations of these concepts just try
to exceed even the one that's standing

0:05:14.979,0:05:19.509
out at the present time so the highest
value again is our best design or the

0:05:19.509,0:05:24.340
competitors best design the white blocks
are within ten percent we don't want to

0:05:24.340,0:05:28.930
dismiss those we want to look at them
since they're relatively close and see

0:05:28.930,0:05:32.169
if there are things in those concepts
that we can combine to get come up with

0:05:32.169,0:05:37.870
an even better concept that the ones
that currently exist so we have critical

0:05:37.870,0:05:41.349
quality parameters or those are the
customer requirements and we've ranked

0:05:41.349,0:05:44.949
them so we know which ones are most
critical and we're capturing them with

0:05:44.949,0:05:48.250

these features or engineering specifications that we come up with as

0:05:48.250,0:05:52.089
engineers we want to look at the house quality to determine which one of those

0:05:52.089,0:05:56.439
features engineering specifications are actually the most critical there may be

0:05:56.439,0:05:59.919
some in there that are more critical than others and we want to look at how

0:05:59.919,0:06:04.089
we can change those to move them in one direction or another we also need to

0:06:04.089,0:06:07.750
look at how the competition is handling or addressing the customer requirements

0:06:07.750,0:06:11.319
look at our best competitors and what their specifications are to see if we

0:06:11.319,0:06:14.469
can embed some of those features into our own concepts to make them even

0:06:14.469,0:06:18.639
better we want to look at those specifications we want hard data the

0:06:18.639,0:06:22.300
specifications coming from our competitors in addition to numbers

0:06:22.300,0:06:26.500
coming from our own simulations or math models to help us to determine what

0:06:26.500,0:06:31.060
changing an engineering parameter what effect that may have on increasing or

0:06:31.060,0:06:35.139
decreasing the performance or improving the function of a concept weighting

0:06:35.139,0:06:39.959
factors again here we have our various customers and each of the customers

0:06:39.959,0:06:43.629
requirements and there
assess or they're ranked so we're

0:06:43.629,0:06:48.279
ranking those for example our customer
ranks durability very high however the

0:06:48.279,0:06:51.939
people producing this particular product
may not be as concerned about durability

0:06:51.939,0:06:56.019
as they are about they are more
concerned about the overall weight size

0:06:56.019,0:07:00.189
or ease with which this product handles
so we need to look at how important our

0:07:00.189,0:07:04.869
chief customer is and considering each
requirement and we need to base our

0:07:04.869,0:07:07.869
decisions on the rankings and the
concepts that we're generating with the

0:07:07.869,0:07:12.189
decision matrix we need to base this
both on numerical measurements and

0:07:12.189,0:07:17.379
also we want to use our intuition in our
common sense we need to be prepared to

0:07:17.379,0:07:21.609
justify our choices so for what reason
did we choose our concept and be

0:07:21.609,0:07:25.689
prepared to argue that choice rationally
and with meaningful data that's produced

0:07:25.689,0:07:29.379
with either simulations or comparisons
with competitors in the market and so

0:07:29.379,0:07:33.609
forth so when looking at these design
matrices and these decision matrices in

0:07:33.609,0:07:37.569

the house of quality we need to ask
ourselves are there hidden subjectivity

0:07:37.569,0:07:42.159
is there something we've overlooked is
there a rating that we're getting from

0:07:42.159,0:07:46.929
the decision matrices really pointing to
what we truly consider to be the best

0:07:46.929,0:07:50.459
choice it's okay to approach some of
these numbers with some skepticism

0:07:50.459,0:07:54.849
because it will encourage us to be more
robust with the information that we're

0:07:54.849,0:07:58.899
producing to support our decisions and
numbers that the house of quality

0:07:58.899,0:08:03.399
decision matrix is coming up with again
your intuition is very important if

0:08:03.399,0:08:06.969
numbers aren't quite coming out right if
a concept that you didn't suspect was

0:08:06.969,0:08:11.469
going to be very strong and showing lots
of strengths it's not to suggest that

0:08:11.469,0:08:15.549
the numbers are wrong or that you put in
the wrong numbers that you want to look

0:08:15.549,0:08:18.789
very carefully to make sure you're not
overlooking something in the modeling

0:08:18.789,0:08:22.299
that could be figured very predominantly
in the numbers that may not be as

0:08:22.299,0:08:26.289
significant as it first appeared is
there any criteria that we're missing is

0:08:26.289,0:08:29.919
there anything that the decision matrix
isn't capturing can we look at those

0:08:29.919,0:08:33.339
close concepts to combine features
that would strengthen the existing

0:08:33.339,0:08:38.469
concepts and make it even better or come
up with yet additional concepts we need

0:08:38.469,0:08:42.759
to evaluate our assumptions question our
assumptions question the data again

0:08:42.759,0:08:46.899
taking a skeptical approach and making
sure that you're prepared to justify the

0:08:46.899,0:08:50.370
numbers that you're getting will support
from either citations from documents

0:08:50.370,0:08:54.529
competitors documents or from your math
models or simulations

0:08:54.529,0:08:58.759
so again points to consider so looking
at both strengths and weaknesses in

0:08:58.759,0:09:03.110
those concepts so that are shown as your
lead concepts and look at those

0:09:03.110,0:09:06.230
drawbacks in the ones that weren't
selected or try to learn something about

0:09:06.230,0:09:10.970
how maybe those may be strengthened I
can improve them it's important to be

0:09:10.970,0:09:16.040
prepared to justify your choices both on
paper and also during a presentation you

0:09:16.040,0:09:19.279
can definitely grow through and change
the rankings or the impact of the

0:09:19.279,0:09:23.329
engineering specifications on those
numbers but be objective and I can't

0:09:23.329,0:09:26.569

stress enough for your preparation in being prepared to document your

0:09:26.569,0:09:31.129
decisions or justify them some good mathematical foundations physical

0:09:31.129,0:09:34.850
concepts to show that your work is robust and that you can defend on the

0:09:34.850,0:09:38.809
work that you're doing with your concepts what to do to include more

0:09:38.809,0:09:43.129
objective ities again combined concepts it's always a good option be sure and

0:09:43.129,0:09:46.579
record your discussions or conversations and your team meetings so you can recall

0:09:46.579,0:09:50.569
important points that people made it may be easy to overlook some things that

0:09:50.569,0:09:56.389
occurred sometime ago or in the recent past so good note-taking and recording

0:09:56.389,0:09:59.300
and reflecting on those conversations can be good and helping you make

0:09:59.300,0:10:03.259
decisions on these concepts as well if you have time you can actually build

0:10:03.259,0:10:07.639
some fast prototypes they don't need to be anything elaborate sometimes you can

0:10:07.639,0:10:10.970
even get away with making something out of play or cardboard or just anything

0:10:10.970,0:10:15.139
that's available if nothing else sometimes a CAD Layout will help you or

0:10:15.139,0:10:19.370
very simplistic CAD model may help all those things combined can help you

0:10:19.370,0:10:24.559
include more objectivity in your choice
of concepts so you've got the decision

0:10:24.559,0:10:27.769
matrix which is based on your customer
rankings and how you've ranked your

0:10:27.769,0:10:31.100
concepts in meeting each of those
customer requirements how your

0:10:31.100,0:10:35.149
competitors have ranked with regard to
each of these requirements as well make

0:10:35.149,0:10:38.269
sure that your engineering
specifications are justified that they

0:10:38.269,0:10:42.050
are having the impact on your designs
that you anticipate the best way to do

0:10:42.050,0:10:46.129
this is maybe with a simulation or math
model any data or hard data that you're

0:10:46.129,0:10:50.000
getting make sure that you can document
that and produce that data if requested

0:10:50.000,0:10:55.029
your discussion and meeting
minutes can come in very handy and

0:10:55.029,0:11:00.079
always be prepared to present your
decision and reason supporting your

0:11:00.079,0:11:05.000
choice of selecting your lead concept so
again the concept selection process

0:11:05.000,0:11:08.390
we're going to be using in this part of
the house of quality

0:11:08.390,0:11:12.770
to embed our customer requirements along
with the rankings of our concepts and

0:11:12.770,0:11:16.730

being able to adequately embed those concepts the functional decomposition in

0:11:16.730,0:11:20.000
the process that we're going to go through to get a simplistic math model

0:11:20.000,0:11:23.720
to brand breaking down the overall functions of your concepts in order to

0:11:23.720,0:11:26.960
be able to look at the inputs and how the engineering parameters are

0:11:26.960,0:11:31.070
controlling those inputs to get the desired result morphological charts and

0:11:31.070,0:11:35.030
matrices can also help your team come up with yet additional ways of looking at

0:11:35.030,0:11:39.020
functions which may help you think of alternatives to include in terms of

0:11:39.020,0:11:43.250
mechanical components to get at those functions a pue chart can be used to

0:11:43.250,0:11:49.400
also evaluate alternative designs PHR can also be used when your concept

0:11:49.400,0:11:54.050
decision is not as cut and dried and is less than ten percent between your

0:11:54.050,0:11:58.580
concepts if that's so if it's less than ten percent then it's always a good idea

0:11:58.580,0:12:04.600
to use a Pew chart to also help you make an objective decision