

A decorative graphic on the left side of the slide, featuring several overlapping, semi-transparent geometric shapes in shades of brown and tan, creating a layered, architectural effect.

20+ Automations of Engineering Work With Custom Software

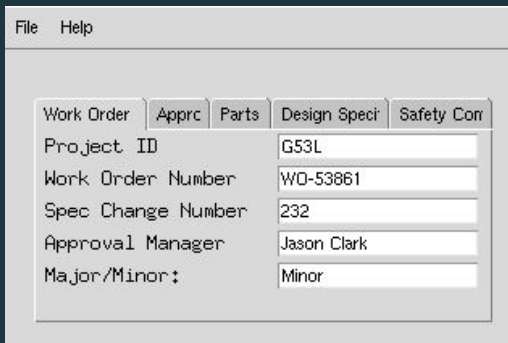
Kirk Automations

Navigate Internal Program, Get Data, Make Email

Problem: Internal Software had a poor UI and many steps to accomplish a task

Solution: Automatically navigate the internal software, get the relevant data, and create a custom email/report with this information.

Savings: 1 hour per day, per engineer. 1010 hrs/yr



File Help

Work Order	Apprc	Parts	Design Spec	Safety Con
Project ID	G53L			
Work Order Number	WO-53861			
Spec Change Number	232			
Approval Manager	Jason Clark			
Major/Minor :	Minor			



Good Morning Jason,

Can you review and approve WO-53861? It's a Minor change for G53L for S-232.

Regards,
Cecilia Payne



Automated Report Generation From Input Data

Problem: With the Weekly Warranty Data and Engineers would make graphs and calculations to decide further action.

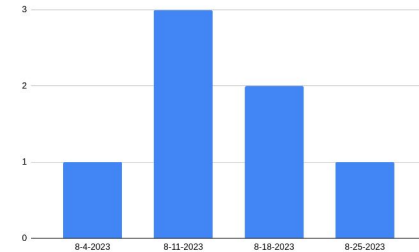
Solution: Automate the graphs, automate the calculations

Savings: 2 hours per week. 100 hrs/yr



Date Received	Warranty ID	Department	Vehicle ID	Description
9-10-2023	786400	Navigation System	L23D	GPS not updating
8-11-2023	786401	Connected Vehicle	L23D	Bluetooth connectivity issues
8-12-2023	786402	Infotainment System	M34H	Screen freezes or blacks out
9-13-2023	786403	Speakers	M4D	Sound quality poor or crackling
8-14-2023	786404	Connected Vehicle	O56J	Vehicle doesn't respond to app commands
8-15-2023	786405	Navigation System	P57K	Maps outdated or incorrect
8-16-2023	786406	Infotainment System	Q76L	Tactile screens unresponsive
8-17-2023	786407	Speakers	R88M	Rattling noise at high volume
8-18-2023	786408	Connected Vehicle	S90N	DTF 80101
8-19-2023	786409	Navigation System	T10O	Error code on navigation system
8-20-2023	786410	Infotainment System	U12P	AUX input not working
9-21-2023	786411	Speakers	V23Q	Bluetooth speaker pairing issues
8-23-2023	786412	Navigation System	V45S	Navigation voice commands not working
8-24-2023	786414	Infotainment System	Y56T	USB port malfunction
8-25-2023	786415	Speakers	Z67V	Distortion at medium volume
8-26-2023	786416	Connected Vehicle	A78W	App not showing vehicle location
8-27-2023	786417	Navigation System	B89W	Lane guidance not working properly
8-28-2023	786418	Infotainment System	C90X	CD player not reading discs
8-29-2023	786419	Speakers	D01Y	Subwoofer not working
8-30-2023	786420	Connected Vehicle	E12Z	Key fob not syncing
8-31-2023	786421	Navigation System	F23A	Incorrect speed limit warnings
9-1-2023	786422	Infotainment System	G34B	CarPlay not connecting
9-2-2023	786423	Speakers	H45C	Amplifier failure
9-3-2023	786424	Connected Vehicle	I56D	C.S. Microphone works rarely or not at all. Said it never worked
9-4-2023	786425	Navigation System	J67E	Route recalculation slow or incorrect
9-5-2023	786426	Infotainment System	K78F	Video playback not available
9-6-2023	786427	Speakers	L89G	Volume knob unresponsive
9-7-2023	786428	Connected Vehicle	M90H	Backup Battery DTC
9-8-2023	786429	Navigation System	N01I	Compass not calibrating
9-9-2023	786430	Infotainment System	O12J	FM radio signal weak
9-10-2023	786431	Speakers	P23K	Speaker wire short
9-11-2023	786432	Connected Vehicle	Q34L	Dashboard camera not recording
9-12-2023	786433	Navigation System	R45M	Traffic updates not refreshing
9-13-2023	786434	Infotainment System	S56N	Media player crashing
9-14-2023	786435	Speakers	T67O	Static noise in all speakers
9-15-2023	786436	Connected Vehicle	U78P	Firmware update failure
9-16-2023	786437	Navigation System	V89Q	SD card not working

8-25-24 Warranty Report



Date Received	Warranty Items	6 Week Moving Average	6 Week By Volume Sold
8-4-2023	1	2.4	0.0009104704097
8-11-2023	3	2.6	0.0009863429439
8-18-2023	2	2.4	0.0009104704097
8-25-2023	1	2.1	0.007966616085



Classify Warranty Claims

Problem: Engineering group receives many warranty claims due to a past hardware issue. They want to classify the hardware issue specifically, and all other warranty items.

Solution: Using Data Science/AI, we gave top 3 recommendations for each warranty item, making it a simple selection.

Savings: 1 hour per week. 50 hrs/yr



Calculate Maximum Condition based on CAD

Problem: Engineers were manually looking up part measurements, populating spreadsheets, and calculating the maximum Amperage.

Solution: Scrape CAD, calculate.

Savings: 1/3 hours per part, 180 parts, 4 times per year. 240 hrs/yr

Compare System CAD to Component CAD

Problem: The system level drawing is made separate from the component level drawing. This means engineers must check for changes at every milestone.

Solution: Scrape the CAD data, check for equivalence, output a report.

Savings: This is used on 360 Drawings, each taking 30 minutes to check, 5 times per year, 4 programs a year. 3600 hours/yr recurring savings.

42	RD0
43	RD1
44	RD2
45	RD3
2	RD4
7	



System End 1	System End 2	Component End 1	Component End 2	Outcome
J5T	M4Q	RD2	M4Q	NG
K2F	T3Y	K2F	Z3D	NG
V4G	A6T	V4G	A6T	OK
B4T	N7D	B4T	N7D	OK
R8R	P4A	R8R	P4A	OK
G1R	Q6E	G1R	Q6E	OK

Check CAD For Safety/Emissions/Critical

Problem: If a component was marked Safety, every of its connected parts needed to be verified to be Safety as well.

Solution: Using CAD + spreadsheet data we could find surrounding components, generate a report of any failed systems.

Savings: 1 hour per drawing, 180 drawings, 4 times per year. 720 hrs/yr

▲S	82124	82166
	H17	Z71
	G60	Z72
	N41	Z73



Action	Type	Terminal	Harness
Add	Safety	Z71	82166



Calculate Specs

Problem: Due to a large number of combinations that affect the part, specs become unmanageably long to reasonably calculate.

Solution: Have the computer calculate it.

Note: Previously engineers were using feelings. This was impossible prior.

Complexity Calculations

Problem: For a risk calculation, specific features of a part are counted and are weighted against the number of vehicles expected to be produced.

Solution: Automate the count with CAD data and combine with the vehicle volume data.

Savings: 15 minutes per drawing, 180 drawings = 45 Hours/yr savings

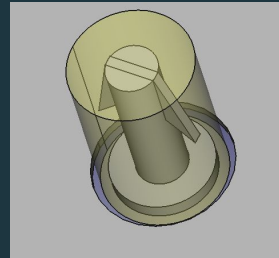
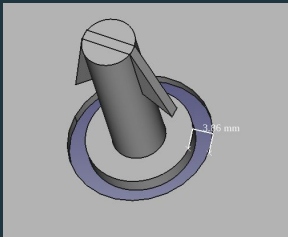
Note: We even used the CAD spec data to be more accurate than the engineers ever were

Fastener Packaging Condition Check

Problem: Each part had dozens of fasteners that needed to be checked to ensure the fastener could be fully pushed in without crashing

Solution: Automate making boundaries based on the fastener shape, report interferences.

Savings: 5 minutes per fastener, 20 fasteners per part, 30 parts, 5 milestones, 4 vehicles.
Theoretically... 1000 hrs/yr. Lazy Engineers won't check, causing build delays



Harness	Fastener Name	Condition	Full Path
62166-8216A	91877-31235-012	NG	62166-8216A/62166-90990/91877-31235-012
62166-8216A	91877-31235-001	OK	62166-8216A/62166-90990/91877-31235-001
62166-8216A	91877-31235-002	OK	62166-8216A/62166-90990/91877-31235-002
62166-8216A	91877-31235-003	OK	62166-8216A/62166-90990/91877-31235-003
62166-8216A	91877-31235-004	OK	62166-8216A/62166-90990/91877-31235-004
62166-8216A	91877-31235-005	OK	62166-8216A/62166-90990/91877-31235-005



Clean Messy CAD

Problem: CAD Designers never go back to rename based on standards

Solution: Auto fix part names

Savings: 30 minutes per part, 30 parts, 5 times per year. 75 hrs/yr



Build Parts List(w/ mass) based on CAD and Spec Options

Problem: Engineers will build each variation and manually calculate mass and center of gravity.

Solution: Scrape the CAD for component and volume data, combine it with a Spec Options file and material file to create a Parts List.

Savings: 6 months of work, 1032 hours per vehicle

A decorative graphic consisting of several overlapping, slanted rectangular shapes in shades of brown and tan, located in the top-left corner of the slide.

Reduce Part Complexity with 'Giveaway' Calculation

Problem: Every feature in a car adds complexity to a wire harness. A reduction in complexity can be lower cost than an unused wire.

Solution: Calculate based on specs what wire harnesses have possible 'Giveaway' wires.

Savings: 2+ months of work per year, 300 hours.



Assign parts based on vehicles and their specs

Problem: Every car needs a part that meets the specs. Engineers are manually lining up the part with a vehicle. This takes 2-4 weeks each time and has human error

Solution: Calculate and assign parts to vehicles, based on specs.

Savings: 600 hours per year.

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Drawing generation

Problem: A finished 3D model needs to be prepared into a 2D drawing that the manufacturing plant uses.

Solution: Our program takes measurements of important features and generates a 2D drawing with the data the plant needs

Savings: 1200 hours per year.



Convert Metric to Imperial

Problem: US shops still use Imperial, but data is received from the customer in Metric.

Solution: Convert drawing measurements into imperial

Savings: 100 hours per year.

Fix mistakes on drawings

Problem: A CAD Designer might forget to delete extra boxes/lines, have an incomplete note, make mistakes when selecting material type, or forget tolerance rules.

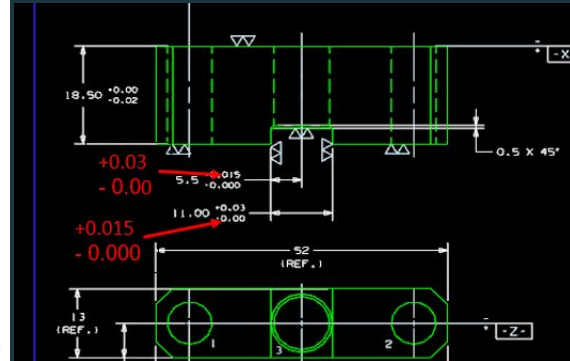
Solution: Check for common mistakes, fix where possible, generate report of changes.

Savings: 350 hours per year.

CORRECT TO STEEL WEIGHT

001	RELEASED	DATE	BY
	DESCRIPTION OF CHANGE	DATE	BY
	REVISION	DATE	BY

SUPP TEMPLATE USE WIPED TAG
 SHEET ORG: MAB26887L SHEET NO.: 2
 TOOL HAS BEEN CHECKED REV. LEVEL 001
 APPROX WT = **0.06 KG**
 DESIGN SOURCE: HIRTEC AMERICA
 THIS MATERIAL IS THE PROPERTY OF GENERAL MOTORS CORPORATION. NO RIGHTS ARE GRANTED TO USE SUCH MATERIAL FOR ANY PURPOSE OTHER THAN FURNISHING OF SERVICES AND SUPPLIES.
 GENERAL MOTORS
 TOOL NAME: BLOCK
 ORDER NO OR TOOL I.D.: MD664398S SHEET # 1 OF 1





Commonize data

Problem: Data comes in from multiple sources and use different formattings, column names, units of measurement, naming conventions, and even shape of data. This data needs to be used in a report.

Solution: Through various rules, we are able to turn all 6 data sources into a common excel format that is easily used to generate reports.

Savings: 2000 hours per year

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Convert Data and Send To Customer

Problem: An engineer needs to open a 3D model, save it in the customers desired format, then upload it to various FTPs, Dropbox, or email. They must remember or look up each customers desired recipient, file format, FTP site, and password.

Solution: Click a button, user selects which customer the data is going to, the program handles the saving and sending.

Savings: 100 hours per year.



Calculate Material Usage

Problem: For an automotive part, silver is applied thinly across the surface of a part. This is expensive and needs to be tracked.

Solution: Using CAD data of the silver trace, we can calculate the cost based on surface area and thickness.

Savings: 100 hours per year.



Calculate Parts List based on Customer Data

Problem: Customers will send CAD data or Excel files with requirements for a part. Engineers take this data and develop a parts list/BOM.

Solution: Using this data and rules for parts, parts lists are automatically calculated.

Savings: 300 hours per year.



Change comparison

Problem: Files often need to be compared, before and after. Manually doing this is difficult and make mistakes.

Solution: Using before and after input data, we can show changes between the two. This is further extended by using rules of equivalence that makes the comparison 'smart'.

Savings: 600 hours per year.



Save Engineering
Hours



Prevent Errors And
Build Delays

Let Your Engineers,
Engineer