

# FOSTERING TRUST IN TECHNICAL SERVICES

THROUGH INTEGRATED, COLLABORATIVE AND CONTEXTUAL LEARNING

BY GRETCHEN MARIE MENDOZA

A thesis submitted to the School of Design / Carnegie Mellon University  
for the degree of Master in Design / Communication Planning and Information Design

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date

Dedicated to my parents and my sisters.

And to lil' Jerry,  
who made Pittsburgh appealing in the first place,  
who always questioned every step I took,  
and whose life changed mine forever.

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Science in Everyday Contexts: Automotive Service Re-Design Study

This study was submitted and approved by the

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## abstract

Trust is an intrinsic component of any loyal “consumer friendship” between customers and service providers, and is a by-product of shared understanding. Nowhere is the notion of trust more relevant than in technical service—such as professional legal practice, architecture, medical care and auto repair—where the primary commodities exchanged are specialized knowledge, equipment and skills. A common challenge in dialogue between expert providers and novice customers in this context is meaningful sharing of technical information. A successful exchange requires care in representation, language, attitude, delivery and timing. Furthermore, with communication breakdowns, trust falters, and business relationships run the risk of falling apart.

Rather than relying on simple transactional exchanges of information in service, a customer’s journey could be enriched by framing service touchpoints as individual opportunities for learning. Learning activities occur in everyday life via interactions with society, artifacts or programs, and often involve the pursuit of knowledge or skills without the structure of a formal curriculum. This study explores how learning might function as a channel for strengthening multi-faceted trust relations in service through integration into programs and artifacts.

In this project, an auto repair shop was investigated as a case study in technical service, given its long inglorious history of customer mistrust. Through exploration in the context of a local mechanic shop, prototypes for experiential and transformative service learning were implemented, tested, and re-shaped into a four-part framework designed to improve technical communications.

Keywords: service design, design for learning, communication planning, collaborative learning, socialization of service, learning workshops, service experience, car care clinic, co-creation



"I always feel like they just don't care about quality or service. The employee was nice, but it seemed like he couldn't get rid of me fast enough."

—FEMALE CAR OWNER, 29

# 1

## PROJECT

Exploring the intersection between learning, experience, communication, and trust in technical services.

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## introduction

Communication breakdowns often occur in technical services because experts and amateurs don't speak a shared language. Explaining complex and tacit knowledge with clarity has an especially high relevance to users who make major decisions “in the dark” and under a great deal of stress. When customers face misunderstanding time and after time, trust—an intrinsic component in any loyal consumer friendship— may falter, and the business relationship runs the risk of falling apart.

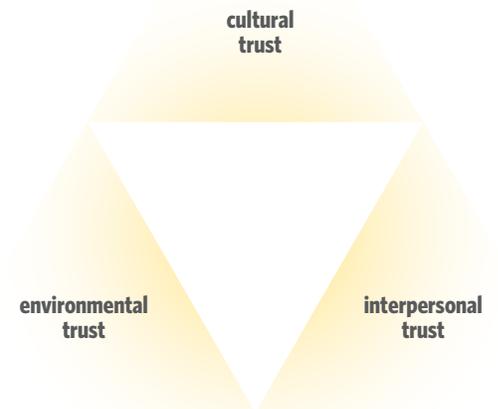
Current service models are often transactional in nature, involving an exchange of goods for cash without much care for the tone, content, or delivery of messages. Considering learning theory in the approach to communications in technical service could serve as a useful baseline given the complexity of the topics being discussed. A need exists to research opportunities in exploring how dialogues in technical service could be improved through an empathic design intervention.

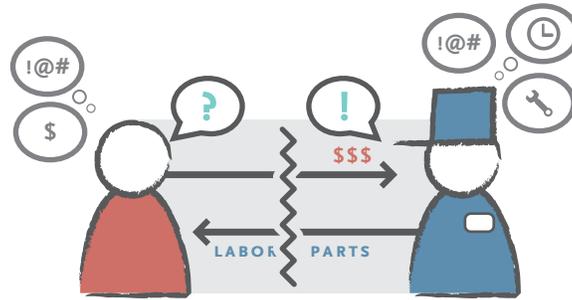
### PROBLEM STATEMENT

*How might a new model for technical service take shape if the learning process—a collaborative and dynamic loop of knowledge-sharing and confidence-building between experts and amateurs—were seamlessly integrated into service touchpoints?*

In this project, an auto repair shop—rich in opportunities for contextual learning—was investigated as a case study for the re-design of communication platforms in service, aiming to empower adult learners with understanding of useful technical issues, and support greater ease and control in personal, informed decision-making. Additionally, through use of a new model, providers could be poised to strengthen relational bonds and loyalty in consumer friendships, fostering three types of trust as by-products of the service:

- » **INTERPERSONAL TRUST** (employee to customer): The one-on-one relationship between provider-as-teacher and customer-as-learner.
- » **ENVIRONMENTAL TRUST** (customer to context): The relationship between a customer and their understanding of technical knowledge as it applies to their personal experience and life.
- » **CULTURAL TRUST** (experts to amateurs): The broad relationship of understanding one another across cultural divides, communication styles and contexts, and improving the visibility of a shared human experience.

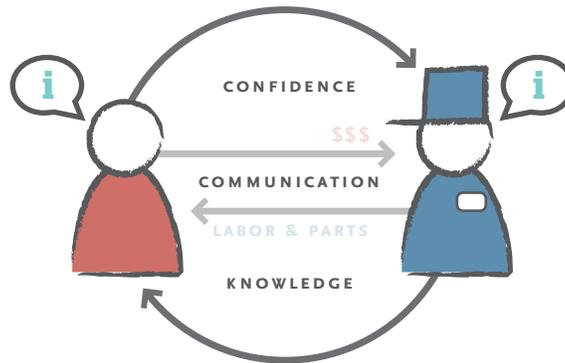




COMMUNICATION BREAKDOWN

Current Service Model

*transaction of cash for goods and labor  
experts and amateurs often speaking different languages*



Future Service Model Stage 1

*the ideal exchange is process-oriented and cyclical  
both parties receive and contribute knowledge and confidence  
through improved communications*

## background

Technical services, as defined in this project, include services such as professional legal practice, architecture, medical care and auto repair, where the primary commodities exchanged are specialized knowledge, equipment and skills. The mechanic industry, in particular, is a ubiquitous and democratic example given our society's reliance on automobiles. Interestingly, mechanics have a historically shady past, 100 years in the making, moving through society from chauffeurs, to experts, to students, to a secure spot within the working class (Borg 2007). The industry also carries with it primarily masculine undertones that often set female car owners apart culturally. Interestingly, 89% of women are involved in the decision-making process for the maintenance of their vehicles, despite the industry's manly reputation (Car Care Council 2008).

Furthermore, while increasing technology is changing the industry at a rapid rate—transforming even the title of “mechanic” to “technician”—small shops face greater operational costs to compete with global manufacturers and dealerships. Whether today's automobiles rely primarily on mechanical or electronic technology, the machines remain unequivocally complex. As Matthew Crawford quotes in his book, *Shop Class as Soulcraft*, economist Alan Blinder said, “You can't hammer a nail over the internet.” (2008) Often, only expert technicians can solve technical problems that are bound to arise. Unfortunately, many experts with tacit knowledge have difficulty in expressing in laymen's terms what they do and why they do it when so much of their technique is experiential and personal.

Furthermore, like service, car ownership is a subjective experience. According to a study conducted by BMW, emotional attachment in car ownership takes a hold in different ways, with gender, identity and lifestyle playing a major role in how users interpret their relationships with a car. (Benson 2006). In this vein, a comparison is easily drawn between car care and healthcare, another ubiquitous technical service.

For these reasons, auto repair makes a relevant and accessible choice for investigation of service enhancements.



Technical Services

*This case study is generalizable to other technical services such as medical care, legal practice, architecture.*



## theory

*Defining Trust in Service* Many individuals express strong feelings of anxiety and speculation towards the trustworthiness of technical service providers. We know that each customer comes with his or her own distinct and personal context, born of prior service experiences and deep cultural models that shape expectations in the service (Ringberg 2007). Generally speaking, an increase in trust would likely alter consumer expectations positively. Yet trust, like service, is difficult to define given its intangible nature (Grönroos 2000, 29). Some theories point to practical metrics like operational benevolence and problem solving orientation as opportunity areas for improving consumer trust (Sirdeshmukh 2002). However, for this design study, trust is defined as a multifaceted construct composed of interpersonal, environmental and cultural influences effected by both customer and provider influences.



### relational

EMOTIONAL / SOCIAL

FOCUS ON ETHICS

DESIRE TO MAINTAIN EMOTIONAL  
TIES WITH PROVIDER, EVEN IN FACE  
OF ADVERSITY



### oppositional

ANTAGONISTIC / SKEPTICAL

FOCUS ON CONTROL

CONSISTENTLY AGGRESSIVE POSITION  
TOWARD PROVIDERS IN CASE OF  
SERVICE FAILURE



### utilitarian

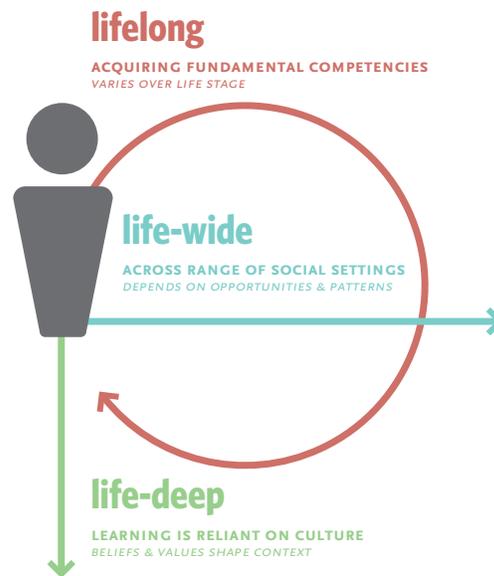
RATIONAL

FOCUS ON DECISION-MAKING

EXPECTED DURATION OF RELATIONSHIP  
IS BASED ON FUTURE BENEFITS  
WEIGHED AGAINST COST OF

Cultural Models in Service Recovery

Service providers must be aware of these cultural models and design offerings to support or diffuse the schema, employing language and attitudes that help to neutralize the extreme cases (Ringberg, 2007).



#### A Life of Learning

The National Research Council stipulates that learning occurs across cultures and social settings throughout life, asserting that culture is bidirectional and dynamic (constantly changing as a result of the learner's community). Culture makes itself relevant to each individual in subjective ways. Furthermore, each individual has a stake in multiple cultural communities. Each learner's make-up is unique (Bell et al. 2009, 28).

*The Role of Emotion in Trust and the Connection to Learning* To build multifaceted trust, service providers must place empathy at the forefront of their business strategies to help build long-lasting relationships with their customers (Dasu and Chase 2010, 2-6). The provider, when reborn into a new role as teacher, is poised to alter customer schemas and create moments of truth that crystallize into positive memories the customer is likely to remember (Dasu and Chase 2001, 80-81). Furthermore, “seeing a knowledge source as trustworthy should increase the chance that the knowledge receiver will pay attention to, learn from, and absorb the knowledge that is transferred” and is critically important when the topic area is complex, experiential, and difficult to verbalize or visualize (Levin & Cross 2004, 1480).

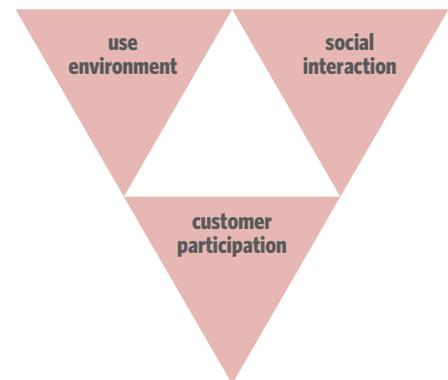
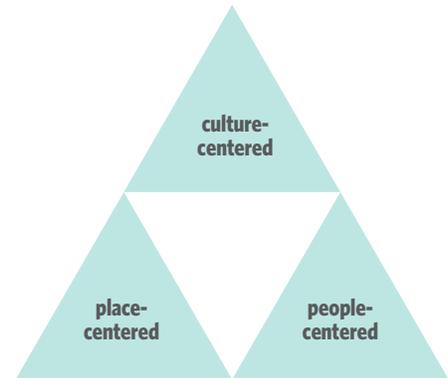
*Defining Informal Learning Settings* Providers have countless opportunities to integrate learning practice during a typical service journey. In fact, learning activities occur in everyday life via interactions with society, artifacts or programs, and involve the pursuit of knowledge or skills without the structure of a formal curriculum (Livingstone 2001, 5). Activities that are social, uninterrupted and self-paced make for ideal informal learning settings, assuming the learner is well-motivated (Norman 1994, 40). A service environment that spans digital and virtual platforms could meet similar criteria and offer information to customers when it is most relevant to them.

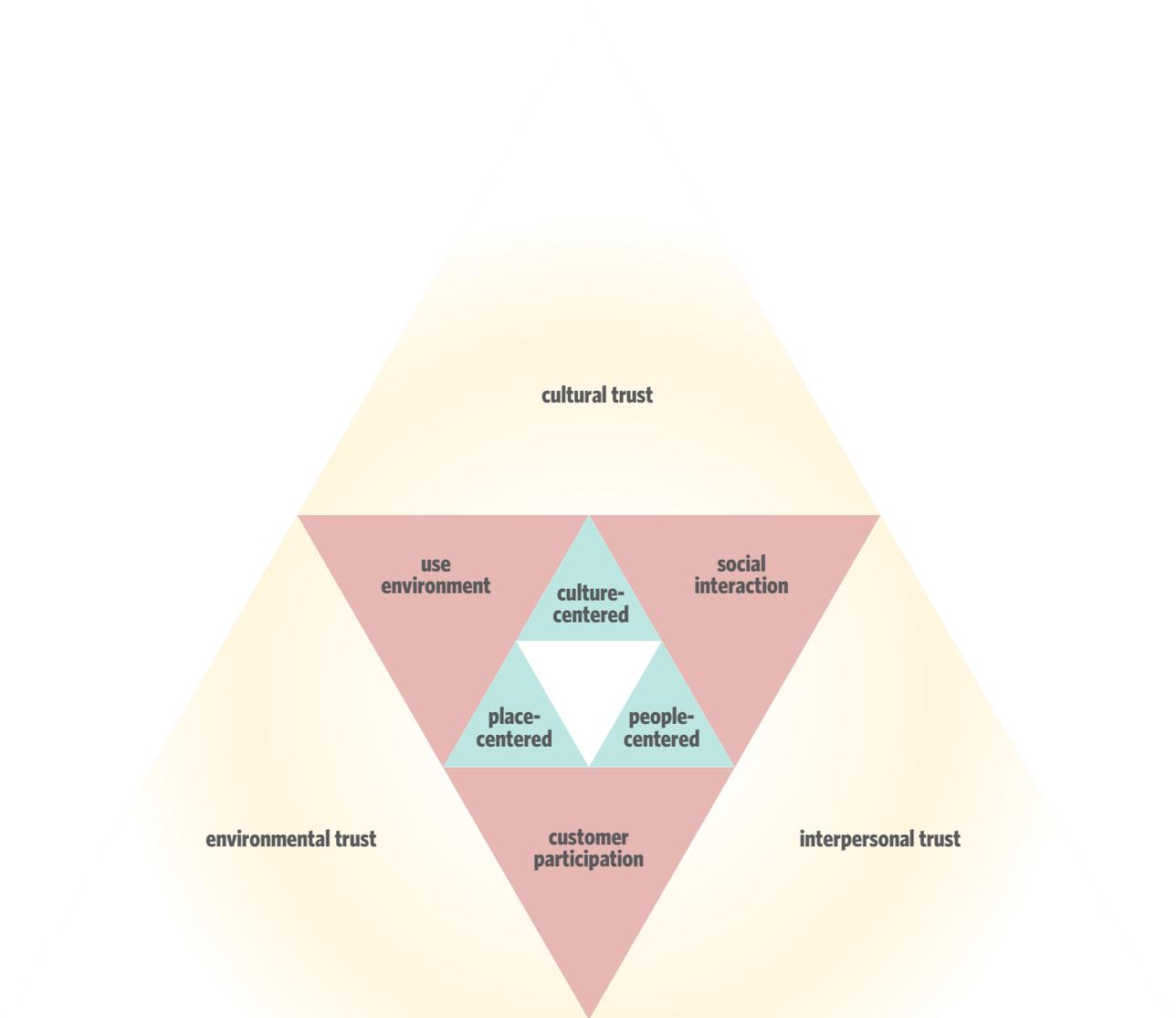
## theory

*The Ecological Framework of Learning* We must not box learning into a single frame, however. Learning occurs as a result of layered opportunities and circumstances, and is an emergent phenomenon. Theory from the National Research Council's report on informal science learning suggests three aspects contribute to each individual's ecology of learning. The people-centered lens relates to cultural norms, social schemas, and metacognition as realized in an individual's prior service experiences, cultural models, and motivational interest in a topic area. The place-centered lens involves a learner's mediated use of physical or virtual artifacts, their ability to improvise with tools and structure activities to aid in the learning process, either spontaneously or using a patterned arrangement. Essentially, this lens suggests that any environment, including a dedicated service space can be transformed into a "Learning Place." Lastly, the culture-centered lens describes the idea of dynamic, subjective participation in learning and the notion of membership into a learning community. In this view, expert service providers become teachers who are charged with welcoming in new members, who in this case are customers-as-learners (Bell et al. 2009, 34-41).

*Designing for Service Experiences* Gupta and Vajic's model sets forth that services can be designed to enhance the possibility for experiences to occur, and that experiences form at the crossroads of use context, participation, and social interaction. Consequently, this idea maps quite closely to the ecological framework described above. As applied to technical service, the customer's experience builds dynamically through repeat visits based on the knowledge they acquire from the environment, other customers, employees, and as a result of their own subjective outlook. Instead of putting the customer's needs at odds with the mechanic's, both groups of stakeholders are poised in situations that accommodate ambiguities and varying expectations, fostering collaborative learning (Gupta and Vajic 2000).

Auto service providers, and other technical services need to harness the power of these emergent qualities in trust, learning, and service through the design of offerings that accommodate the unpredictability of the human condition in order to enhance the possibility for experiences. As shown on the adjacent page, learning and service theories register with the three forms of trust the project seeks to enhance. Each system moves between three "arms:" the personal or environmental context of an individual (micro); how an individual "plays" with others; and what that the individual's involvement suggests about the larger cultural landscape (macro).





## approach

The project approach was comprised of four steps. First was researching the literature on best practices for building a trusting service experience. Second was isolating the practices of a local shop that seemed consistent with this literature. Third was identifying practices from the literature that the shop was not yet using. Last was to propose an integrated design intervention that addressed opportunities for improvement in the shop.

### CASE STUDY

Research activities were limited to the context of a single, local, community-driven shop, where typical interactions, behaviors and relationships could be observed. The environment offered a reasonable cross-section representative of other independent shops of a similar scale, with approximately 8 employees and serving nearly 100 customers per week on average. The shop expressed explicit and pro-active interest in engaging users through the use of educational information graphics, service re-design, and/or environmental adjustments. They have a sustained commitment to evolving environmental technologies and improving customer relationships.

In addition to the local shop environment, car owners at large were surveyed extensively, as the topic is generalizable outside of the local scale.

Through collaboration with all participants, functional prototypes and artifacts were produced to evaluate interest and success in contextual adult learning in service. High-fidelity prototypes remain a goal in the long-term.

### SCOPE

The focus of this study is service design and the role of communications and learning within service. The focus was not graphic design, interaction design or service science. While theories of both informal learning and formal education were reviewed, the loose curricula presented in this document have not been assessed by educators.

## FRAMEWORK

Although many theoretical constructs influenced this study, Bernice McCarthy's 4MAT learning cycle was formative and integral in segmenting aspects of the studies and design. Both prototypes rested heavily on the premise that customers as learners would need to move through the entire cycle for effective learning to be achieved through use of the products, artifacts, and programs.

## INSPIRATION

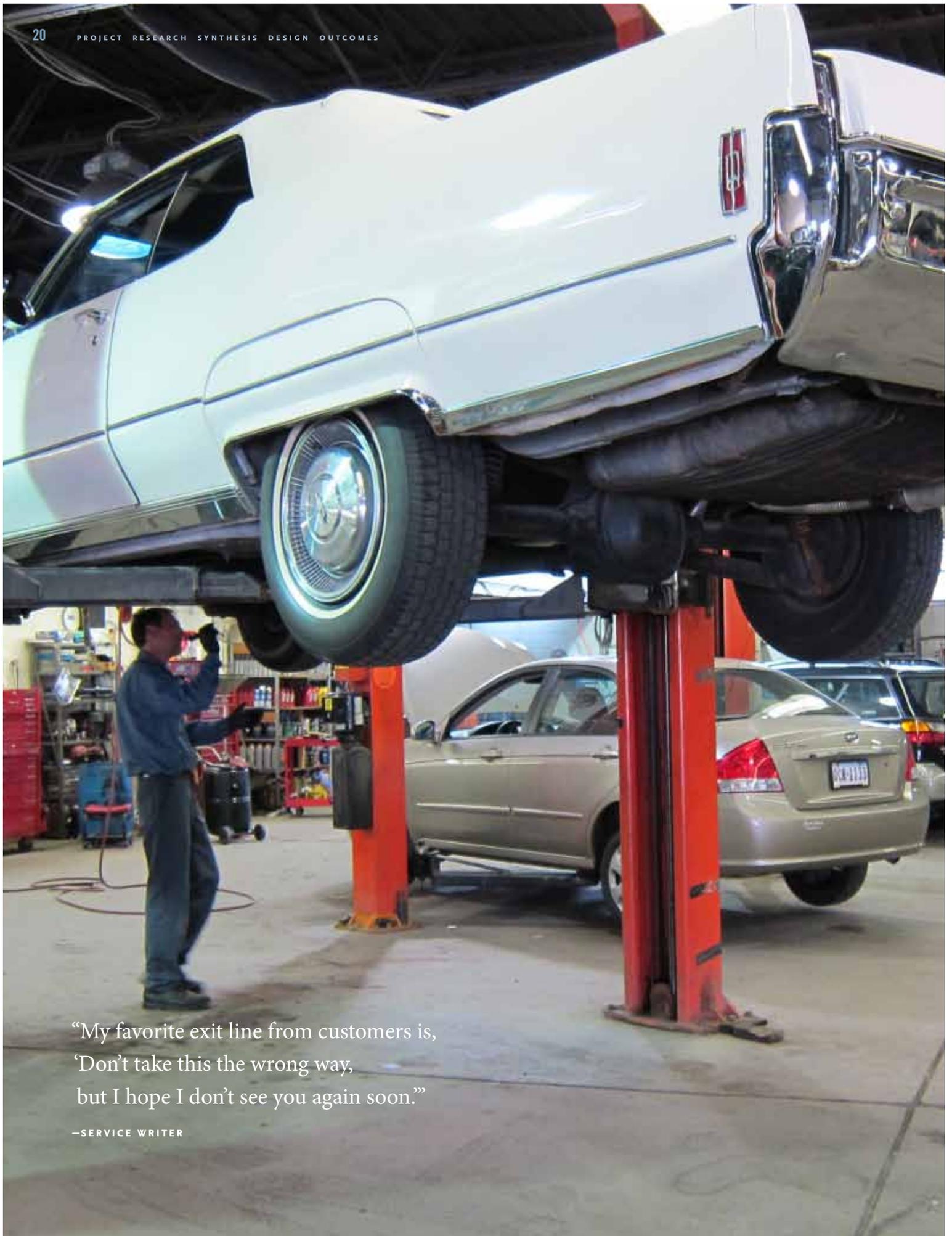
Initial inspiration for the project included sparking and sustaining excitement in science by providing adults with rich information in ways that enable clear understanding of complex science topics—without oversimplification—in a context where the information is relevant. Keeping in mind that some users do not feel intrinsic motivation to explore science topics, the project lens shifted to personalizing information to encourage deep understanding, rather than simply presenting science concepts. Through exploration of unique learning “spaces” and artifacts, the study became a personal investigation into the nature of immersion in physical spaces, social connectivity in learning, cultural influences, interactivity, and the subsequent impact on spectatorship, participation and excitement.

### Project Territory

*The scope of this project easily expands to include many disciplines, all of which were considered by way of readings and exploration.*

SYSTEMS  
**SERVICE DESIGN**  
**TRUST**  
**COMMUNICATIONS**  
**INFORMATION DESIGN INFORMAL SETTINGS**  
 ARTIFACTS & VISUALIZATIONS **ADULT LEARNING**  
 EXPERIENCE

TRENDS  
**SOCIETY & TECHNOLOGY**



“My favorite exit line from customers is,  
‘Don’t take this the wrong way,  
but I hope I don’t see you again soon.’”

—SERVICE WRITER

# 2

## RESEARCH

Discovering needs and opportunities through conversation, storytelling and analysis.

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## plan artifacts framing observations blueprint journey

Extensive exploratory research was conducted using a variety of methods in an effort to better recognize needs of the car-owning population and to investigate the perspectives of independent shop owners. Nationally distributed surveys offered quantitative data, while ethnography, shadowing, interviews, and service journals generated glimpses into qualitative experiences, both of which informed the design direction and problem framing.

A critical aspect of this phase proved to be the time spent gathering the mechanic's point of view on their experiences and industry. In getting to know these individuals, it became clear that they may have never been asked to comment upon the ideas of communication or where distrust in their industry originates. Their responses were passionate and eye-opening.

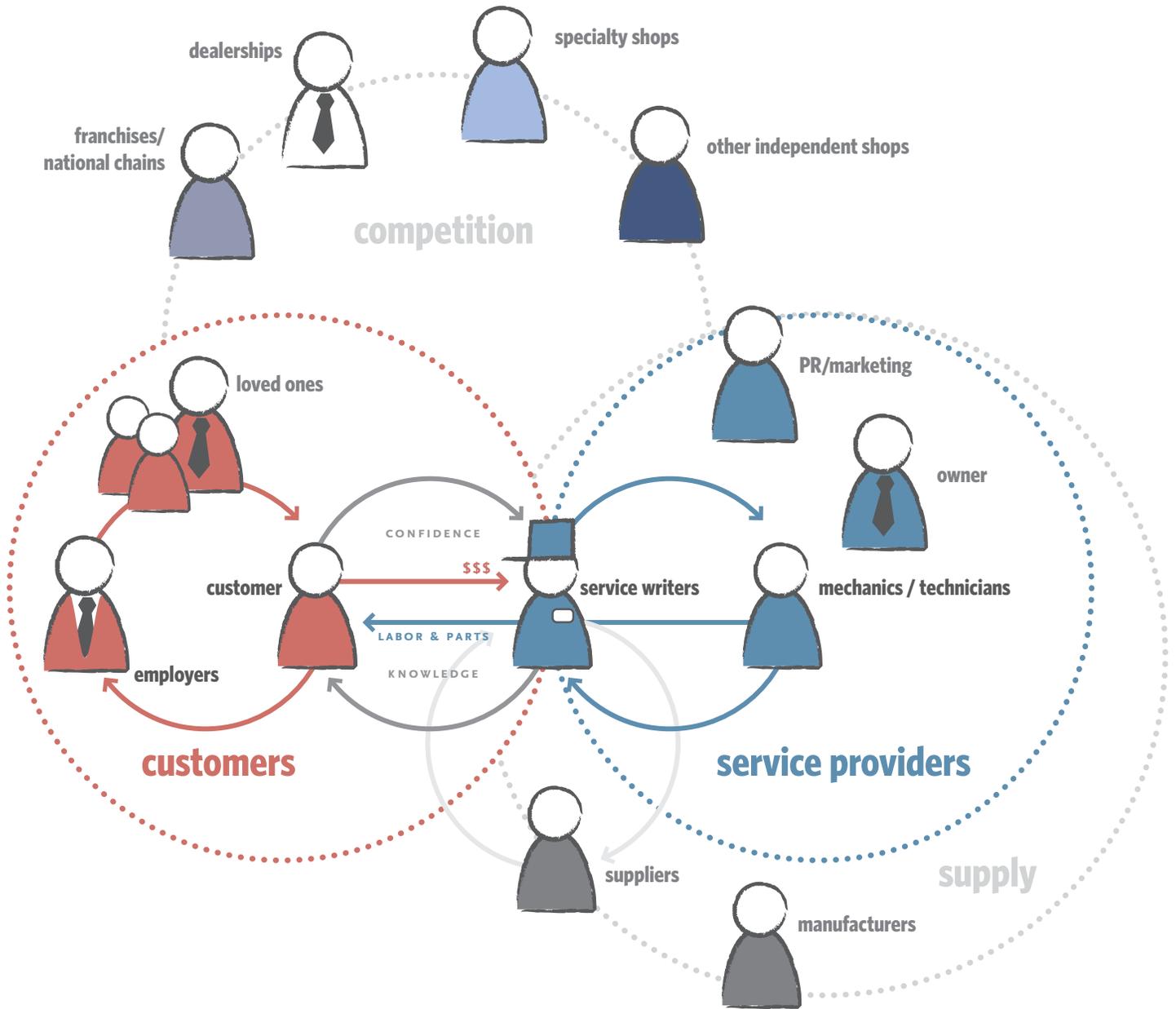
Following the exploratory phase, opinions on early design strategies were gathered during "speed dating" sessions. Here, several conceptual ideas were presented to individuals for feedback and ratings. Commentary about usefulness and desirability was used to co-design the prototypes and also determine the critical mass of interest in some ideas over others.

Finally, prototypical events and artifacts were tested for usefulness and desirability. Primary goals were measuring success in both comprehension of basic mechanic principles and preventative care, but also in the capacity for trust to be strengthened through learning events.

As a result of these activities, a service ecology began to emerge. While different demographic categories of customers exist, most users in the system (customer or providers) experience the basic structure of interactions in the service system. The system map illustrates typical flows of energy between key actors in a typical service journey, including the customer's personal circle, the service provider family, and the external agents that can have an effect on a consumer friendship.

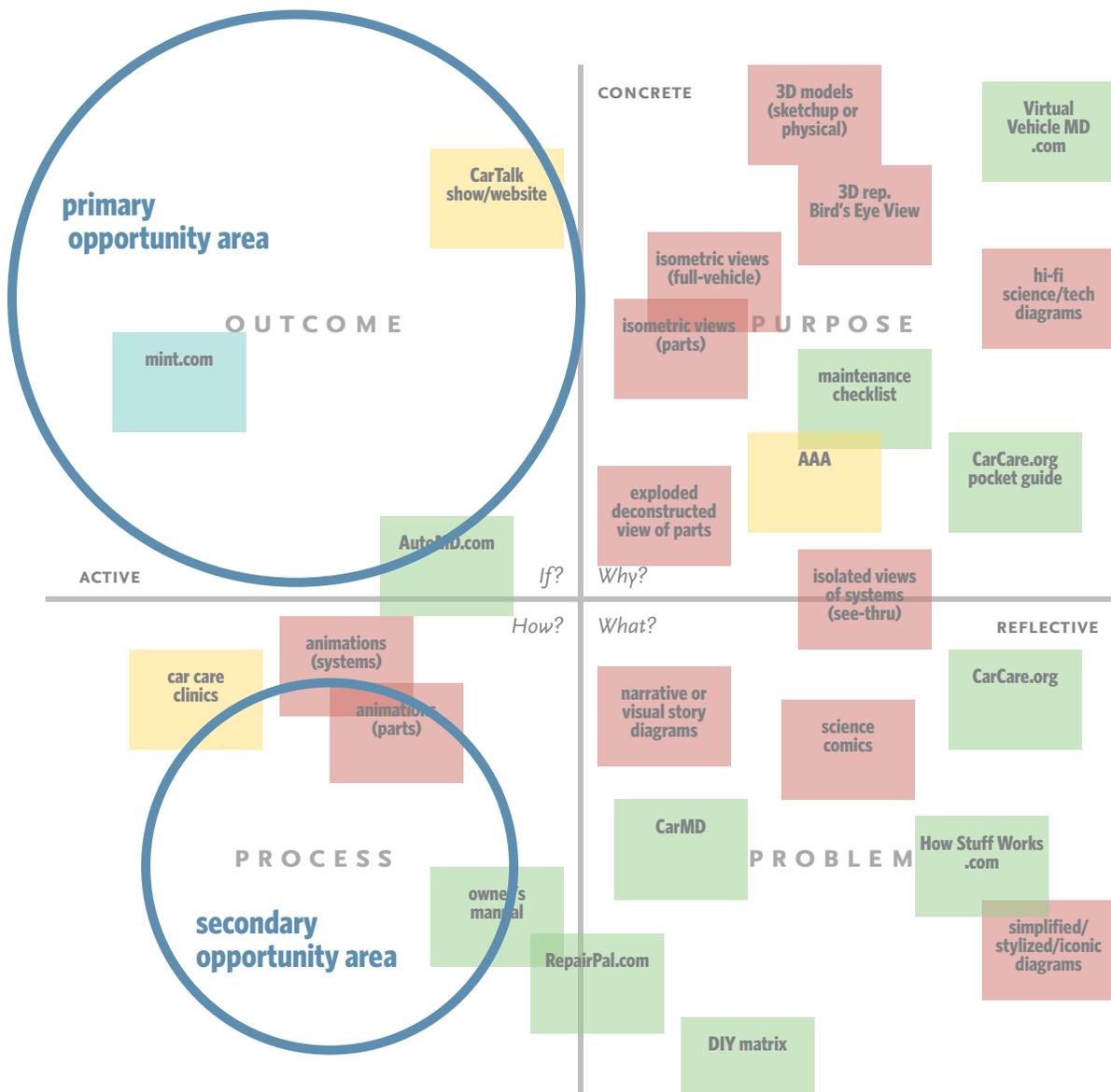
### METHODS

- » exploratory survey  
(55 respondents, national)
- » back-of-house tours, shadowing & contextual inquiry  
(4 hours, local)
- » ethnographic observation of shop behaviors and environment  
(30 hours, local)
- » formal & unstructured interviews:  
[4] employees  
[1] mechanic instructor  
[1] design instructor  
[8] car owners  
(10 hours, local)
- » service experience journals  
(8 participants, national)
- » concept speed dating  
(7 participants, local)
- » feature analysis survey  
(67 respondents, national)
- » before-and-after event evaluation  
(11 participants, local)



## plan artifacts framing observations blueprint journey

To better comprehend the availability and affordances of tools that support understanding and action in car care, an extensive collection of artifacts was assembled and analyzed according to the learning climate it best supports. The goal of the exercise, which was constructed throughout the entire research process alongside exploratory activities, was to locate opportunity areas in spaces that are currently under-served.



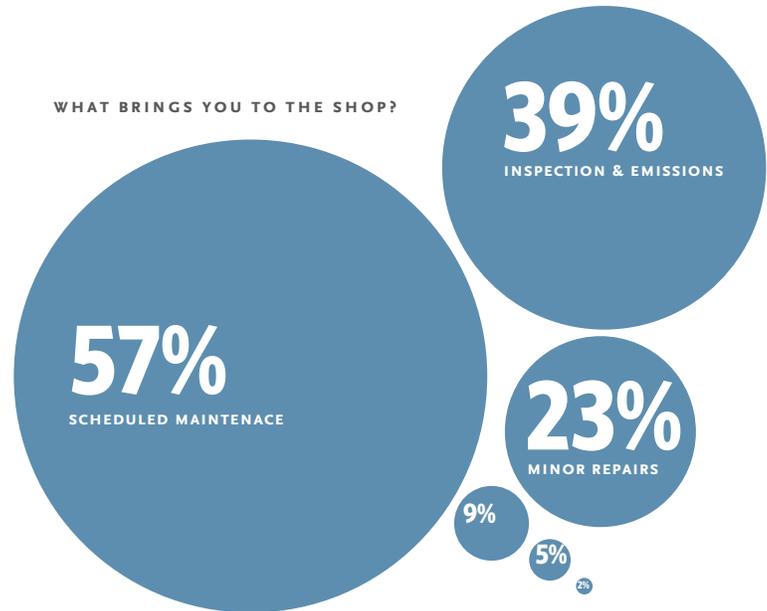
	visualizations physical or digital	tools online	tools offline	programs / events
<b>examples</b>	<ul style="list-style-type: none"> <li>» How Things Work.com animations</li> <li>» diagrams in car manual</li> </ul>	<ul style="list-style-type: none"> <li>» www.CarCare.org</li> </ul>	<ul style="list-style-type: none"> <li>» CarCare.org guide</li> </ul>	<ul style="list-style-type: none"> <li>» CarTalk radio program</li> <li>» Ask Patty.com</li> </ul>
<b>affordances</b>	<ul style="list-style-type: none"> <li>» makes things invisible that are often naked to the human eye</li> </ul>	<ul style="list-style-type: none"> <li>» dynamic</li> <li>» frequently updated</li> <li>» customizable</li> <li>» self-driven</li> </ul>	<ul style="list-style-type: none"> <li>» self-driven (offline)</li> <li>» accessible</li> <li>» clear</li> <li>» encyclopedic</li> </ul>	<ul style="list-style-type: none"> <li>» dynamic</li> <li>» conversational</li> <li>» humorous</li> <li>» participatory</li> </ul>
<b>weaknesses</b>	<ul style="list-style-type: none"> <li>» existing visualizations don't deal with transformational information</li> </ul>	<ul style="list-style-type: none"> <li>» information overload</li> <li>» reading online (hard to find "flow")</li> <li>» most instances of use are not social</li> </ul>	<ul style="list-style-type: none"> <li>» easy to forget about</li> <li>» dry tone, sometimes too technical</li> <li>» static</li> <li>» not always relevant</li> </ul>	<ul style="list-style-type: none"> <li>» not always very detailed</li> <li>» difficult to capture info</li> <li>» info is often irrelevant</li> </ul>

#### DESIGN IMPLICATION

- » Missing from the current landscape of service artifacts are tools and programs designed specifically for novices hoping to personalize car care deeply and actively.

## plan artifacts framing observations blueprint journey

In an effort to frame and direct the overall project in terms that resonated with a diverse car-owning audience, an exploratory survey was distributed to identify significant macro-scale trends. Interviews supplemented these findings with in-depth, personal accounts that became useful scenarios to consider during the design process.



### Exploratory Survey

A general survey was distributed early in the project process to measure general interest in mechanic science and determine consumer logic for choosing service providers. Additionally, users were asked to identify associations with communication styles and offerings in mechanic care.

### WHAT'S THE COMMUNICATION STYLE LIKE?

## 80% call auto service "masculine"

SPA TREATMENT	MEDICAL CARE	AUTO SERVICE
70.0% nurturing	56.8% educational	80.0% masculine
57.9% feminine	46.7% condescending	34.0% informative
28.8% experience-centered	41.7% rude	33.3% condescending
26.2% welcoming	33.3% apathetic	30.9% straightforward

### WHAT'S MOST IMPORTANT IN AUTO SERVICE?

**83.7%** expertise  
**67.4%** trust  
**53.5%** price / value

### Employee, Instructor and Customer Interviews

Brilliant insights were uncovered during one-on-one discussions with car owners, employees of the shop and a mechanics instructor.

“Whenever you see a person’s eyes glaze over or forehead furrowed, they don’t have a clue what you’re talking about. And if you’re in sales, the rule is: if you confuse the customer, you’ve lost the customer. People will walk away from a sale, without even knowing why. If anything triggers that instinct of ‘this just doesn’t feel right, I don’t feel good here,’ then they walk away from the sale.”

—SERVICE WRITER

“Most of the students don’t want to sit in a classroom, they prefer hands-on learning. But because of the technology in cars, you need to really understand the theory before you get to work.”

—MECHANICS INSTRUCTOR, ON TEACHING NEW STUDENTS

“I have to give myself a pep talk. I’ve actually gone into the bathroom in the mechanics and cried. Because it was so much money, and I had no say over what it was going to be. And I just had to trust everything they said.”

—FEMALE CAR OWNER, 34

#### DESIGN IMPLICATIONS

- » Not surprisingly, the industry was largely considered masculine, a clear cultural barrier to trust for many women.
- » Scheduled maintenance was the primary focus of visits. Therefore, deep mechanical knowledge about rare issues felt much less critical a focus area for the study. Instead, actionable everyday car care guidelines would prove more useful.
- » The survey confirmed that expertise and trust were leading factors in choosing a technical service provider.

## plan artifacts framing observations blueprint journey

Doblin Group's AEIOU design methodology, an analytical framework of heuristics, aided the interpretation of research observations in the shop environment, as shown.

### A — Activities



### E — Environments



#### customers

- » waiting for service
- » coordinating arrangements
- » understanding issues
- » making decisions
- » weighing options
- » paying

- » clean physical conditions, employees seen tidying up
- » cool temperature, well-lit; sounds include traffic, airplanes, shop noise, typing, phone ringing, conversations
- » not exactly kid-friendly, but rare for kids to stay and wait
- » physical evidence suggests credibility (inspection / emissions signs; clipboards / keys; staff uniforms)
- » atmosphere has a retro feel: charming, vintage radios, wood paneling, pinball machine, gumball machines,
- » framed black/white vintage Pittsburgh photographs (suggests association with local community)

#### providers

service writers

- » managing service flow
- » calling customers
- » explaining services
- » multi-tasking between making phone calls, dealing with customers, engaging with one another
- » managing parts delivery

- » clear physical and social separation between front of house and back of house, movement in and out between all members of staff
- » sometimes front desk is left empty
- » waiting area intentionally designed to feel like a dentist's office (not a technical place)

#### general observations

- » mostly drop-offs and pick-ups (only about 5% wait, and about 1-2 people waiting at a time)
- » those who wait usually read magazines, take phone calls (some elderly become agitated, waiting a long time)
- » parts delivery is significant part of flow in and out of the shop
- » day-to-day operations alternate between busy periods (early morning, end of day) and slower lulls in between

- » no privacy, totally open, everyone can hear one another
- » unusually bright and spacious waiting room

**I – Interactions**



**O – Objects**



**U – Users**



- » lots of phone calls: many about appointments, scheduling pick-ups; some related to PR follow-up or service recovery
- » loyal customer friendships: communication style with “regulars” is different, more fluid and expressive; descriptions use more jargon/technical terminology; lots of waves to locals who drive past the shop and honk
- » walk-ins: unsure about outcome, a little more hesitant to approach

- » online virtual aid
- » drawings
- » part sheets
- » technical diagrams
- » examples of actual parts (before/after)
- » invoices
- » emails
- » text messages

- » demographically mixed men / women old / young single / married experienced / inexperienced
- » major categories students professionals elderly
- » each group carries different set of cultural and personal expectations

- » service writers and technicians collaborate and discuss customer scenarios (both positively and negatively)
- » messengers are often more friendly than staff, who offer no greetings or goodbyes

- » old/new parts
- » work orders
- » labor management system

- » service writers located at front desks, the interface between customers and technicians
- » technicians include three levels: “A” Technician: expert “B” Technician: intermediate “C” Technician: apprentice, junior

- » conversation style often bare minimum, somewhat friendlier to customers, with some employees being more wordy than others
- » language is polite
- » focus seems to be diffusing emotions, not necessarily empathizing or listening closely
- » service writers take the time to explain the problems/diagnosis; customers seem to appreciate explanations, remain engaged during that process; down-to-earth metaphors used to help illustrate ideas (via phone conversation)

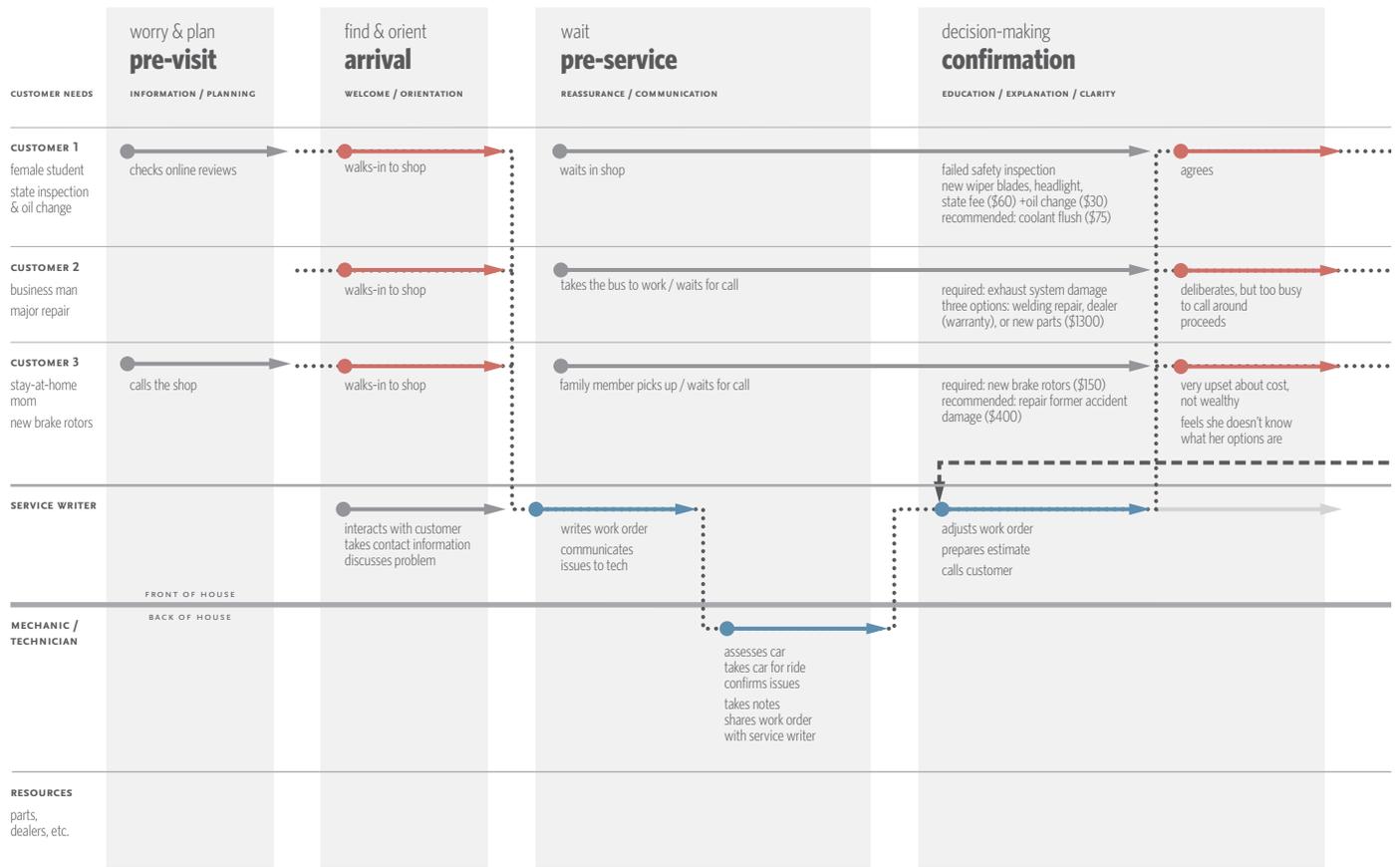
- » visual tools assist in verbal explanation
- » move towards more online communications; requests for texts and emails are increasing

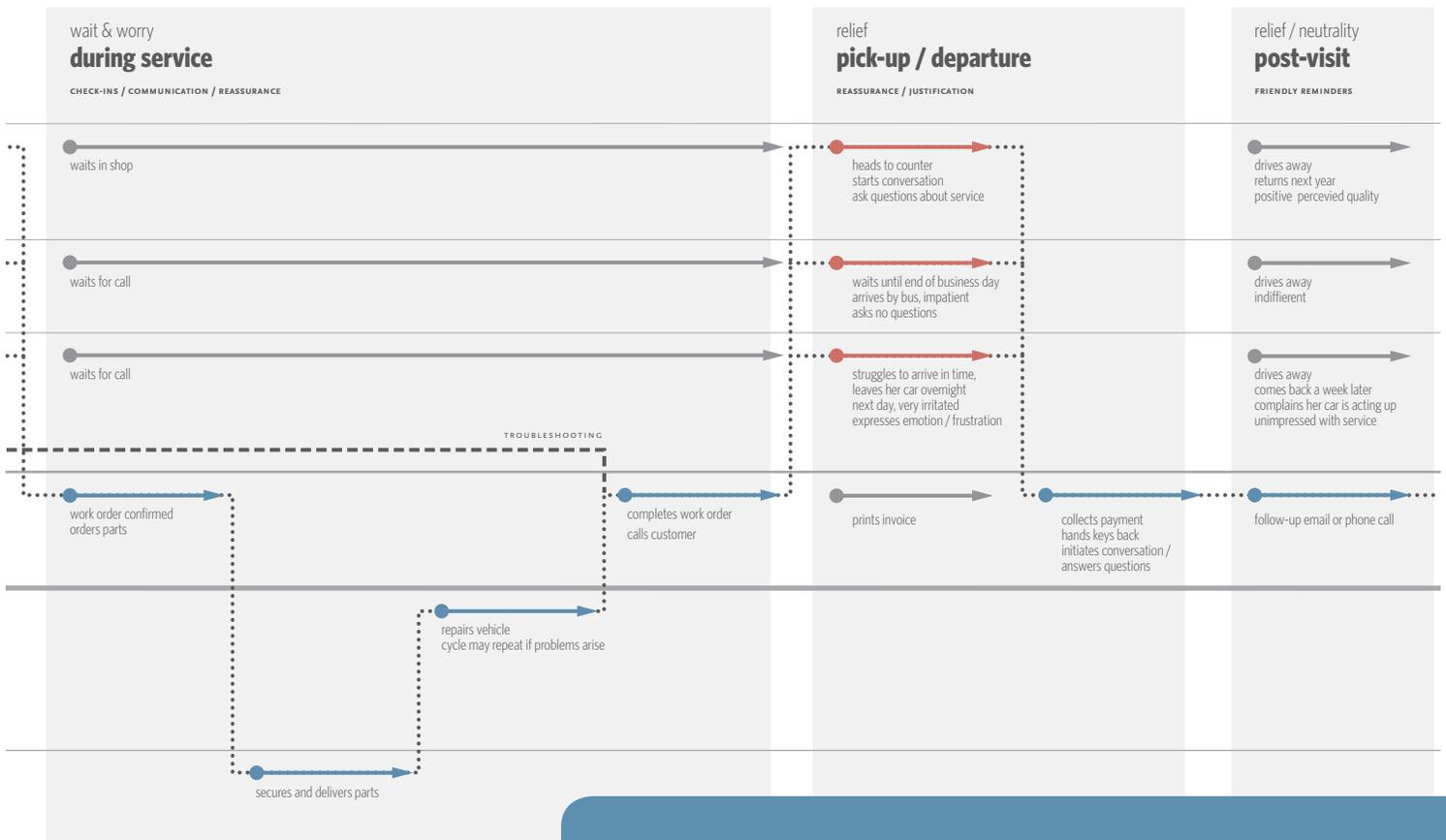
**DESIGN IMPLICATIONS**

- » Idle waiting time could be learning time.
- » Conversations are perhaps the most critical communication channel in the service experience.
- » Opportunities exist to improve visual aids – current use is limited, especially in supporting phone calls.

## artifacts plan survey observations blueprint journey

Rather than looking at aspects of the experience in chunks, a clear picture arises once data from various sources is compiled onto a single map. After hearing from multiple employees and watching typical interactions in the shop, a service blueprint showcasing the paths of several personas was created to capture typical flows and interactions between front and back of house, as shown below.



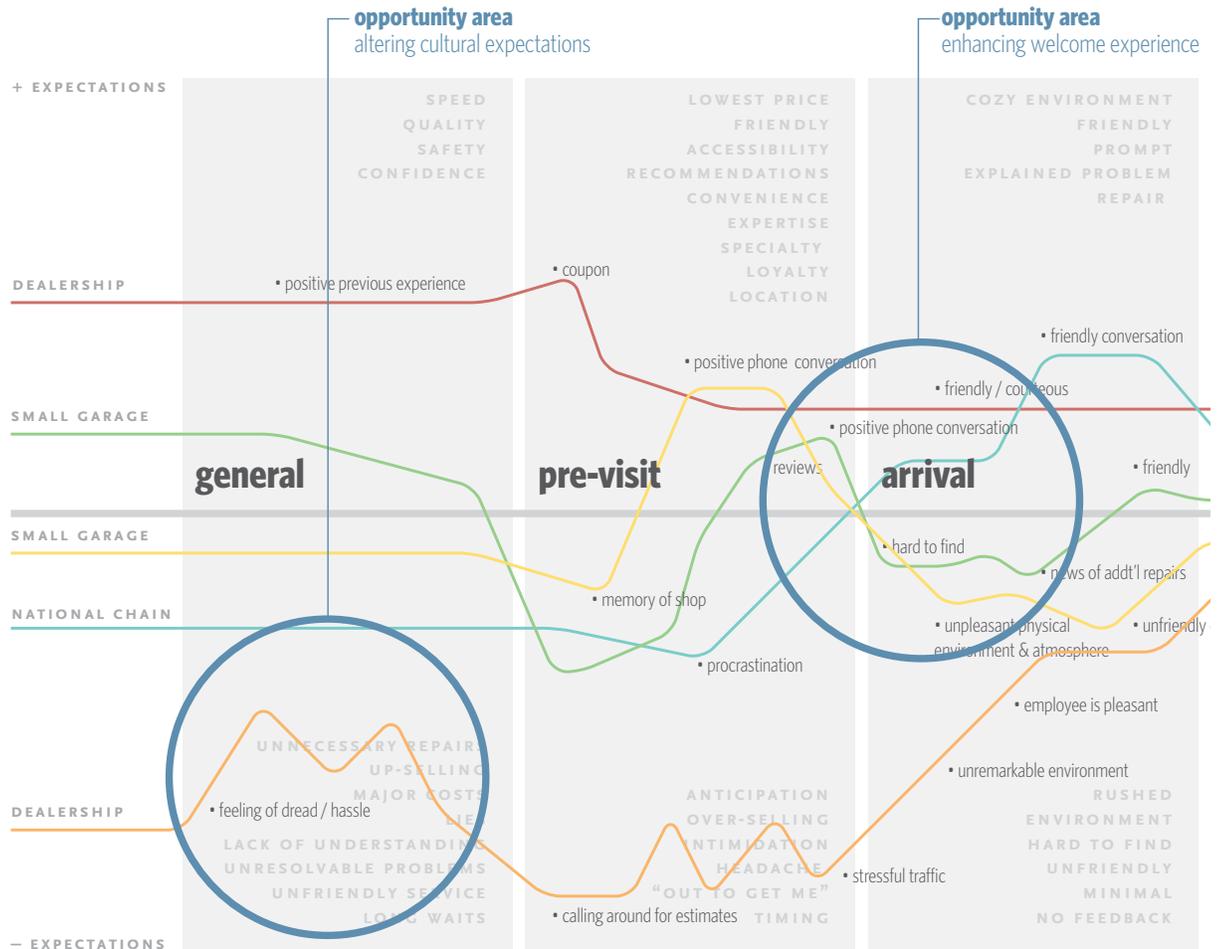


**DESIGN IMPLICATIONS**

- » The structure of most visits is essentially the same.
- » Time spent waiting is where anxiety usually builds, many unknowns.
- » Conversation style is critical to the success of dialogue whether on the phone or in person. Employee approach either incites, diffuses or empowers.

## plan artifacts framing observations blueprint journey

Each individual's expectations of a service visit will differ from those of the next person. Participants completed journals chronicling a service visit, start-to-finish. Below, select narratives are mapped together to cluster journeys, uncovering opportunities for improvement — where emotions plummet or when negative expectations seem to pile up.

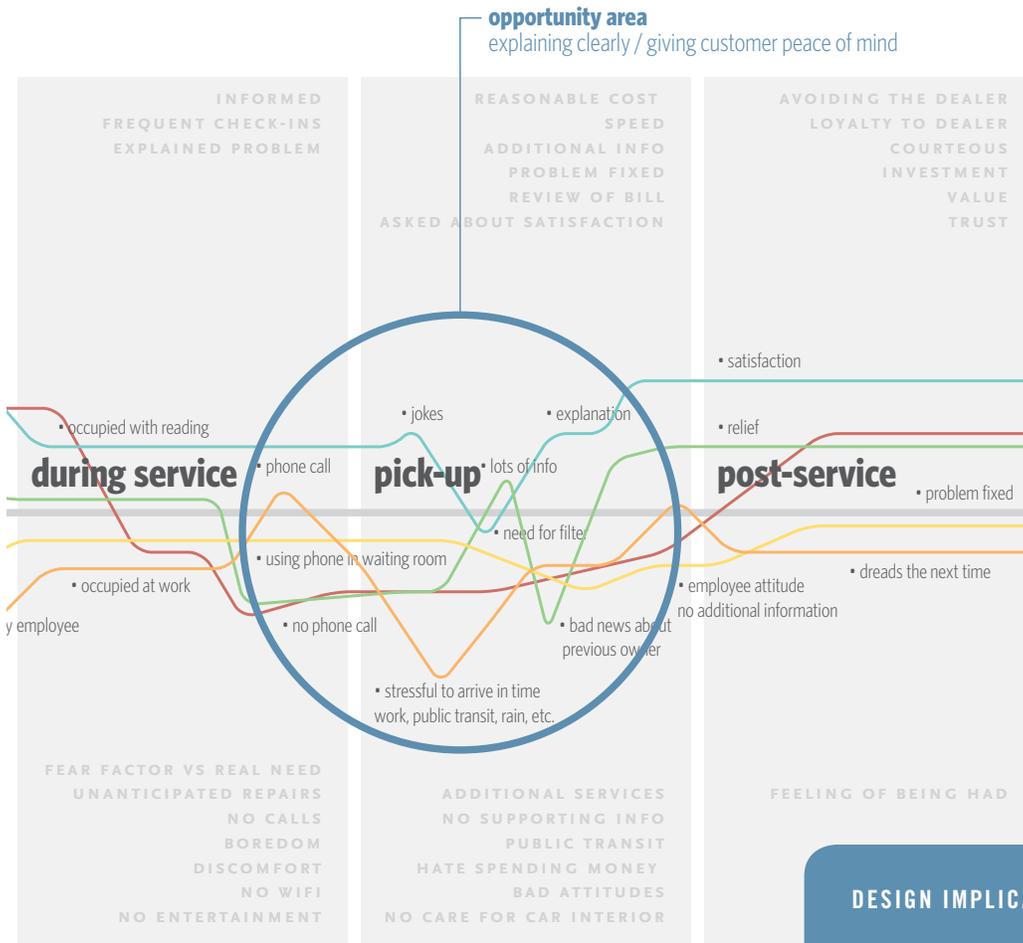


“The dread, the hassle, the despair of having to deal with this is so thick.”

—FEMALE CAR OWNER, 29

“I expect the predictable ‘good feeling’ you’ll have knowing your car is safe after being serviced.”

—FEMALE CAR OWNER, 36



“A little friendliness during the transaction would have gone a long way.”

—MALE CAR OWNER, 60

**DESIGN IMPLICATIONS**

- » Every customer brings their own baggage to the service experience.
- » Feeling of anxiety are strongest before a visit, upon arrival, and at decision-making touchpoints.



“A customer that comes in, hands you their keys, and says, ‘take care of my car’ is not a bad customer for us. It’s easy. As long as we do our job right, don’t mess anything up, don’t do anything to betray trust, that’s the most painless transaction we’ll have all day long.”

—SERVICE WRITER

# 3

## SYNTHESIS

Making sense of what's been seen, heard and felt to frame a new space for design enhancements.

FINDINGS & OPPORTUNITIES 36

IDEATION 40

## findings & opportunities

### HIGH-LEVEL INSIGHTS

The following themes were discovered through the course of the research, many of which differed from my personal expectations.

#### 1 **Society & Technology**

Cars have become the “big mystery” as society deals with the rise of technology and a move away from tangibility.

#### 2 **Service Ecology**

Auto repair shops are an expensive & high-tech business to run, affected by industry-imposed pricing structures and in competition with manufacturers gaining more control over the after-market industry.

#### 3 **Social Schemas**

In an industry widely considered masculine, women are major decision-makers in car care and tend to expect different things out of service relationships. Both sexes express anxieties around “being ripped off.”

#### 4 **Reputation**

Opinions conflict. Dealership technicians were reported as both “trustworthy experts” and as “scam artists.” Small shops also vary in appeal usually due to customer tolerance of the physical environment and amenities.

#### 5 **Personalization & Customization**

No two customers are alike. There is considerable variation in both diligence (preventative care vs. crisis management) and interest in mechanic science (“just fix it” vs. “help me understand.”)

#### 6 **Communication**

A language barrier exists between technical experts and average folks. Explanations lead to a greater feeling of control, yet the descriptions are often not fully understood due to complexity of the issues.

#### 7 **Emotion**

Anxiety & stress are at their worst before a visit, but many customers also experience frustration at the moment they need to make a decision about service.

Rather than focusing on societal issues which are difficult to address at the scale of and within the timeline of this study, I focused on how the design of communication tools could effect the last four points, primarily looking at #5 and #6 to fuel positive effects related to points #3, #4, and #7.

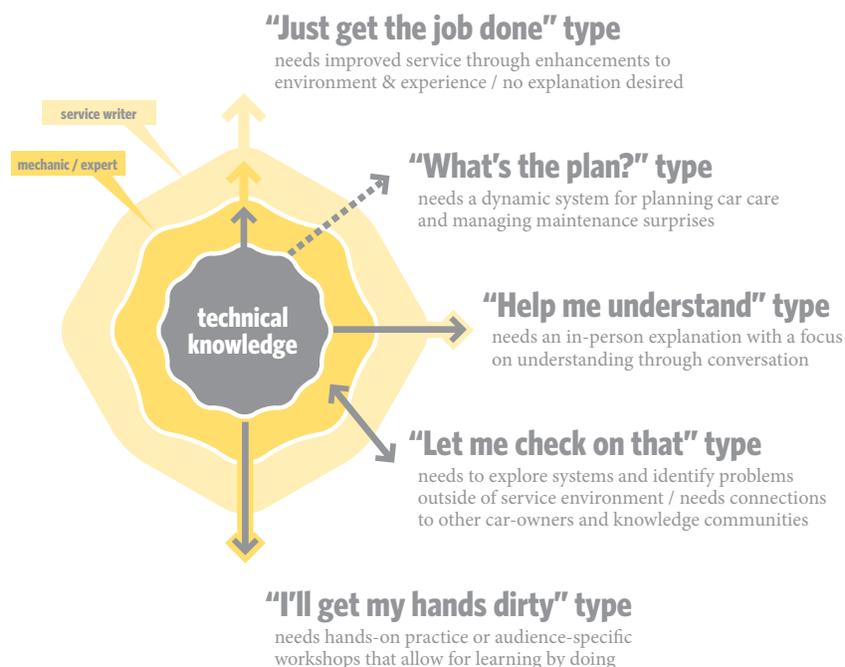
## NEEDS ASSESSMENT

In order to address the diverse learning needs of their customers, service providers need tools and programs that allow them to meet the greatest pain points in technical services:

- » **UNDERSTANDING** Customers need technical knowledge to be shared in a manner that aids in deeper comprehension. The science or skills offered by a technical service provider often stretch outside the reach of the average adults skillsets, but the knowledge is an essential component of the service exchange.
- » **ACTION** Customers need support in confidence-building and decision-making during critical “moments of truth.” Technical providers are often dealing with customers during high-stress scenarios that involve major decisions, such as managing a crisis. Artifacts and programs that encourage preventative or iterative care could help lessen these occurrences. Also, personalizable information that is delivered in a positive tone, would help to address the wide range of issues at play. In addition, customers express a desire to have options spelled out for them in a clear and accessible way.

## CUSTOMER TYPOLOGIES

Customer segmentation cripples efforts to design dynamic service experiences (Parker and Heapy 2006, 85). Typologies were developed to group customers attitudinally rather than by simple demographics. Preferences in learning styles and trends in service expectations were primary considerations in the groupings.



## findings & opportunities

### IDENTIFYING SPACES FOR IMPROVEMENT

Once needs and customer typologies were identified, attention was turned to investigating spaces and platforms where the design intervention could be implemented. Gupta and Vajic's model suggests that in designing for service experiences, designers must consider three channels: facilitating social interactions, designing activities that encourage participation, and adjusting the physical layout of rooms and objects to support engagement (Gupta and Vajic 2000). Using this theory as a base and culling exploratory research for missed moments for meaningful information exchange, the following opportunity spaces were identified: (1) Hands-On, (2) Conversation, (3) Logistical/Practical Communications, (4) Virtual Environments, and (5) While You Wait.



## DESIGN OBJECTIVES

Finally, a clear framework of design objectives emerged as a result of synthesizing the research findings, pairing themes with user needs and integrating theoretical constructs. The matrix below reflects an effort to situate these design objectives within the larger project goal of enhancing multi-faceted trust in technical services on all three levels: interpersonally, environmentally, and culturally.

	<b>Participation</b> How might participation foster understanding?	<b>Evidence</b> How might evidence be exhibited?	<b>Experience</b> How might experience be enhanced?
<b>cultural trust</b> experts-to-amateurs	Break down misconceptions between mechanics and average customers through increasing opportunities for social interaction.	Showcase mechanic culture; give customers access to the technicians' expertise and perspective.	Encourage active customer participation and social interaction inside and outside the service visit.
<b>environmental trust</b> customer-to-context	Create information-rich learning environments—both physical and virtual— to aid customers in the decision-making process at the right time and right place.	Make the physical environment more transparent, eliminating barrier between back-of-house and customer zones.	Provide amenities that exceed subjective expectations, accounting for the dynamic nature of individual visits.
<b>interpersonal trust</b> employee-to-customer	Resolve the language barrier through use of personalizable tools that support conversations between individuals who speak different languages.	Train employees to look beyond “diffusing” discussions, but rather tending to customer emotions. Practice behaviors and attitudes that support the service concept.	Build long-lasting relationships, focus on personal connections, and give the customer control of information that will support loyalty.

## ideation

Using the design objectives as a point of departure, the following 10 ideas were shopped around to multiple participants using a method known as “speed dating” and rated in terms of desirability, usefulness, and likelihood of use. Three ideas scored very high in terms of usefulness: the web application, the electronic auto record and hands-on workshops. Given the locally-focused scope of the project, the first and third options were investigated in greater detail.

- 1 **Car Wellness Web Application**  
Online car care management tool
- 2 **Sensory Diagnostic Tool**  
Device for identifying common symptoms
- 3 **Touch Screen Information Table**  
Interactive encyclopedia for self-directed exploration or facilitated explanations
- 4 **Conversation Cards**  
Visuals for common repair conversations
- 5 **Educational Museum Interior**  
Redefined service environment functions as interactive learning space,
- 6 **3D Models**  
Multiple fabricated models of common repairs, parts and systems
- 7 **Environmental Model**  
Larger-than-life full-size installation of often unseen parts and systems
- 8 **Car Manual Redux**  
Reworked format for the common standard of personal car information
- 9 **Electronic Auto Record (EAR)**  
Similar to electronic health records, an exploration of a data management system that offers lifetime tracking for a single vehicle
- 10 **Hands-On Workshops**  
Experiential learning activities that invite customers into the back of house

“I’d like to have online access to a preventative plan, a means of eliminating surprises.”

—FEMALE CAR OWNER, 29

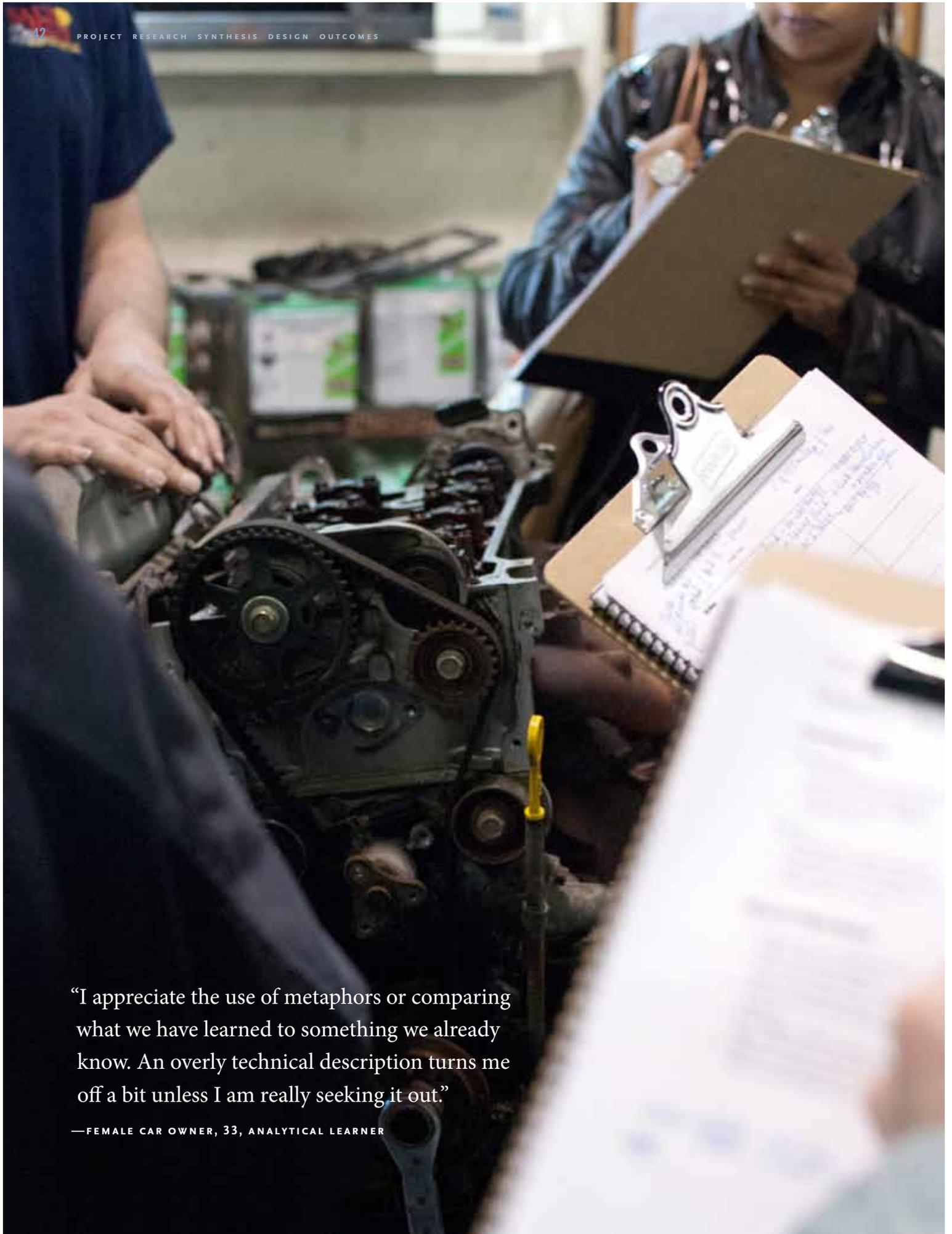
“I would like a well-organized account of the car’s ‘personal’ history and maintenance schedule, that follows the car around. It would be reassuring.”

—FEMALE CAR OWNER, 28

“It would be really great to learn how to do something like change my oil, although the workshop should be limited to only simple things. Being audience-specific is also really important. I wouldn’t want to be with pros.”

—FEMALE CAR OWNER, 29





“I appreciate the use of metaphors or comparing what we have learned to something we already know. An overly technical description turns me off a bit unless I am really seeking it out.”

—FEMALE CAR OWNER, 33, ANALYTICAL LEARNER

# 4

## DESIGN

Putting theory and observations to work  
in a new system of artifacts and programs.

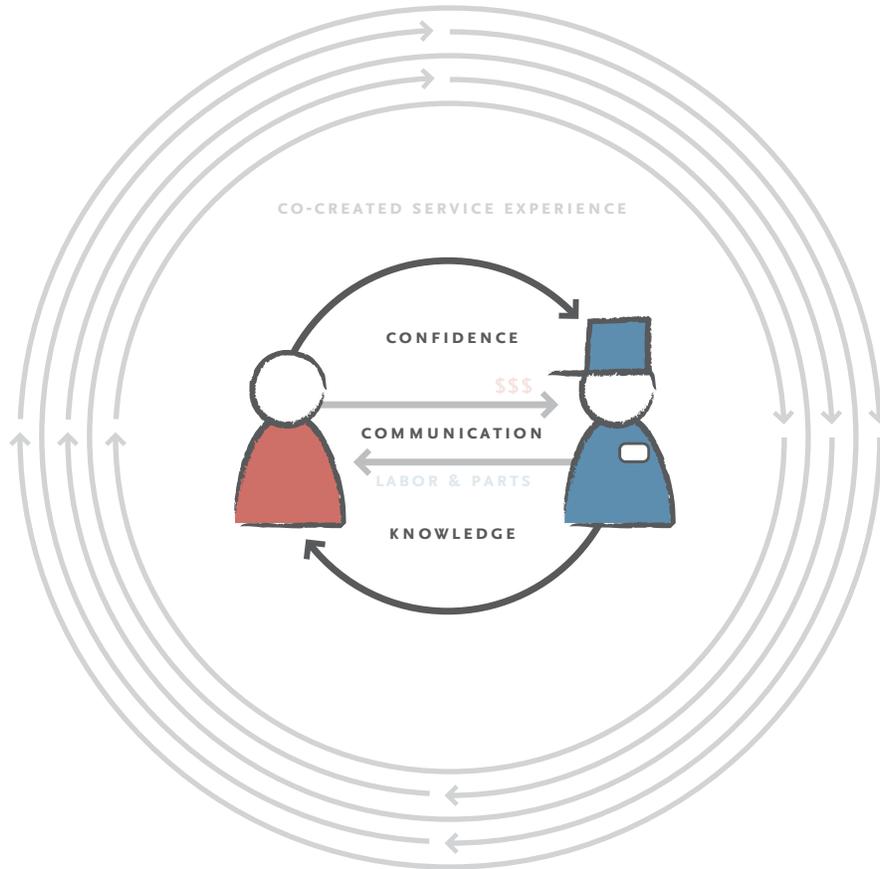
DESIGNING FOR CO-CREATION	44
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WORKSHOP PROTOTYPE	64

## designing for co-creation

People are changing faster than organizations are. With decades of expanding choice, the focus of services should not be on making people the same through standardization, but instead on the unique co-creation of service experiences (Parker and Heapy 2006, 20).

“The idea of co-production demands that public servants... focus not only on the internal workings and efficiencies of existing services, but also on how people engage with those services, and how they can be mobilised, coached and encouraged to participate in the ‘common enterprise’ of generating positive outcomes” (Parker and Heapy 2006, 85). Viewing services as support systems rather than a simple exchange of commodities reinforces the potential opportunity in integrating learning into technical service touchpoints. For the 21st Century customer, prescriptive models of service are not sustainable.

According to Parker and Heapy, service designers can segment audiences across the following criteria: attitudinally (values and beliefs); behaviorally (practical reasons); based on a journey (routes people take to arrive at the service including emotional entry points); and self-driven (inviting customers to choose from a menu of offerings) (2004, 22). With self-segmentation, customers can create multiple “personas” for themselves, reframing their needs based on the unique circumstances of a given service experience. By constructing their own identity dynamically with each visit, customers build confidence in their own knowledge context, enhancing environmental trust — in themselves and in their surroundings.



Future Service Model Stage 2

*communication is supported, confidence builds and knowledge is shared over time  
the service experience grows dynamically with repeat visits  
and is experienced uniquely by both the service provider and customer'*

## solution framework

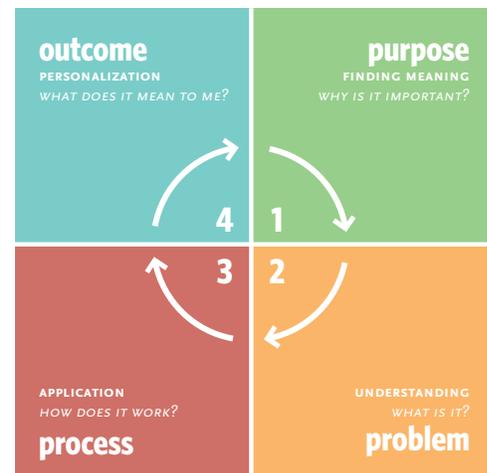
An additional form of categorization was adapted for this study: learning segmentation. In synthesizing learning theory with exploratory design research and the idea of co-creation in service, a solution emerged that would rely on types of learning styles to facilitate communication of complexities in technical service.

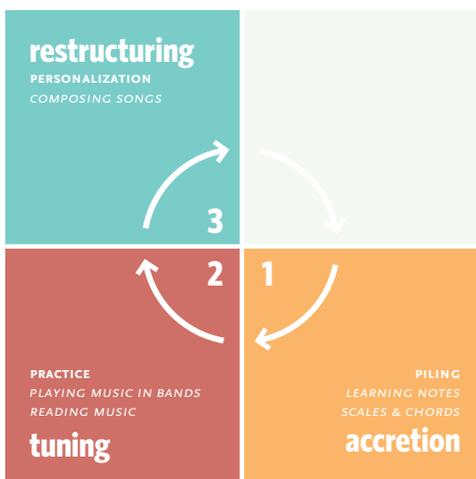
### TYPES OF LEARNERS

Bernice McCarthy's 4MAT theory suggests that all individuals associate most readily with one of four learning types based on their preferences for processing (what we do with information, e.g. watching and doing) and perception (how individuals receive new information, e.g. feeling and thinking). Students flow between these categories, of course, but they tend to feel most comfortable in a general area. Therefore, to make integrative learning in service equitable for all customers, aspects of the design must cater to various learner types, recognizing that each individual will engage in materials differently (McCarthy 2000, 87-115).

### THE CYCLE OF LEARNING

McCarthy also identifies the four core elements of learning as: meaning, conceptualization, problem solving and transformation. The emphasis is on the cycle of learning rather than on appealing to individual learning styles and moving outside of “comfort zones to the edges of our competence” (McCarthy 2000, 210-225). Framing environmental service needs within McCarthy's model would first call for an open, nurturing tone and climate that enhances trust and allows the learner (customer) to receive, while the teacher (service provider) motivates. The second learning climate could take shape in the service environment as an exposition of technical information and facts presented in a friendly, accessible fashion for the purpose of explanation. The third phase involves students taking more personal action in an effort to reach their own conclusions, such as applying knowledge in a service exchange where critical decisions must be made, given unique circumstances. The fourth and final stage of the cycle involves would foster the customer's ability to turn the experience into something of their own, empowering the user with information about the service that can be adapted for a personal purposes, such as planning and budgeting.





### STAGES OF LEARNING

Three stages of learning—accretion (piling), tuning (practice), and restructuring (personalization)—are all critical components for successful understanding (Norman 1994, 28-31). These three steps or styles loosely match to McCarthy’s ideas, although they rest heavily on principles of cognition rather than student-teacher relationships. The idea here is for artifacts and programs to facilitate each stage of the cognitive learning process. For technical information in service, a listing of facts and/or diagrams will not be enough. Instead those finite bits of information will need to be presented and visualized in a way that encourages re-visiting (tuning) and re-framing (restructuring) by the learner. This aligns with the service model that suggests knowledge is a dynamic phenomenon that is largely influenced by the context of the problem, interaction, and participation (Gupta and Vajic 2000).

### THE ROLE OF ARTIFACTS IN LEARNING

Norman covers issues of artifacts as “external aids that make us smart” and claims that “powers of cognition come from abstraction and representation: the ability to represent perceptions, experiences, and thoughts in some medium other than that which they have occurred, abstracted away from irrelevant details” (Norman 1994, 47). There is a need for rhetorical restraint in the design of technical artifacts: making selective choices in content and tone to best communicate with an audience promotes understanding.

“The expert use of artifacts for responding to problems or accomplishing projects that people engage in can be viewed as a desired form of intelligent human performance in its own right.”

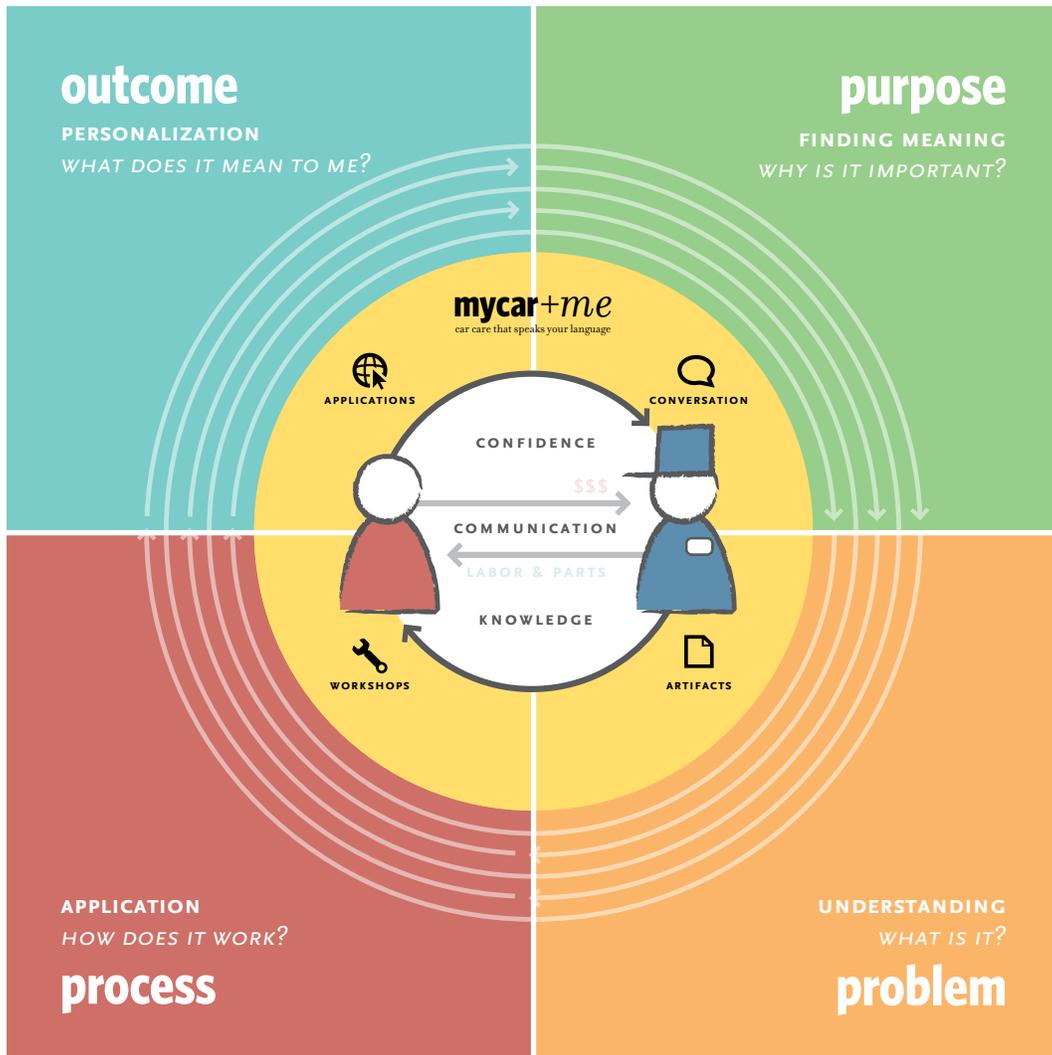
—EDWIN HUTCHINS, *COGNITION IN THE WILD* 1995

## solution strategy

*mycar+me* is a system that moves customers and providers from the current state of communication breakdowns in technical service towards a supportive cycle of meaningful exchange and personal transformation, grounded by design in learning principles at both macro and micro scales.

*mycar+me* is a suite of tools designed to aid service providers in facilitating customer dialogues to support understanding and action-taking using four high-level strategies: conversations (communication guidelines); artifacts (a family of visualizations); workshops (curricula and planning for hands-on learning events); and applications (robust information management, messaging and visualizations).

The mapping is flexible. Each component of the system supports a different stage of learning and serves different types of learners best. Rather than prescribing a program to all customers, the model allows for customers as learners to pick and choose how to improve their service experience with the service provider as the guide on their journey.



Future Service Model Stage 3

*mycar+me is a four-part communication system that uses the learning process as a channel for improving trust*

## system overview

*mycar+me* is designed to provide various types of learners with access to relevant information, delivered by the system or directly from the service provider. The components map directly to the learning cycle, while also meeting many of the design objectives specified during the synthesis phase of the project.

	<b>Participation</b> How might participation foster understanding?	<b>Evidence</b> How might evidence be exhibited?	<b>Experience</b> How might experience be enhanced?
<b>cultural trust</b> experts-to-amateurs	Break down misconceptions between mechanics and average customers through increasing opportunities for social interaction.	Showcase mechanic culture; give customers access to the technicians' expertise and perspective.	Encourage active customer participation and social interaction inside and outside the service visit.
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<b>interpersonal trust</b> employee-to-customer	Resolve the language barrier through use of personalizable tools that support conversations between individuals who speak different languages.	Train employees to look beyond “diffusing” discussions, but rather tending to customer emotions. Practice behaviors and attitudes that support the service concept.	Build long-lasting relationships, focus on personal connections, and give the customer control of information that will support loyalty.

## COMPONENTS

Moving into the system, four major components emerge, each serving customers/learners and providers/teachers with a unique suite of features.



### **Conversation** *Why is this important?*

- » **CUSTOMER** experiences greater understanding through assistance in finding meaning in the technical processes with down-to-earth approach
- » **PROVIDER** receives guidelines for delivery of technical explanations through databases of tactics and scenarios that provide assistance in speaking a shared language with customers



### **Artifacts** *What is it?*

- » **CUSTOMER** sees visual aids and illustrations that make problems easier to comprehend, accessible offline and online
- » **PROVIDER** explores databases of various visualizations that support conversations related to common repairs to be shared with customer during critical decision-making moments



### **Workshops** *How does it work?*

- » **CUSTOMER** learns of rich opportunities in active experiential learning
- » **PROVIDER** gains access to databases of guidelines and flexible curricula to host successful learning workshops



### **Applications** *What does it mean to me?*

- » **CUSTOMER** uses a car care management tool with personalized timelines that support planning and forecasting, and encourage dialogue with mechanics
- » **PROVIDER** moves towards electronic communications and record-keeping, encouraging preventative maintenance and gaining access to new and existing customers

Prototypes were developed for the workshop and application components, since they offered excellent opportunities to explore both experiential and transformative learning, and bridged physical and virtual platforms.

## application prototype

### PURPOSE

Research suggested that a web application supporting car care management from an objective, third party perspective was highly desirable. A key aspect was neutrality of the source — users wanted to be sure what they were reading did not benefit the service provider. Additionally, throughout interviews with instructors, users, and shop employees, ideas of diagnostic tools were mentioned on numerous occasions as being a potentially useful application for improving communications about diagnoses and problems.

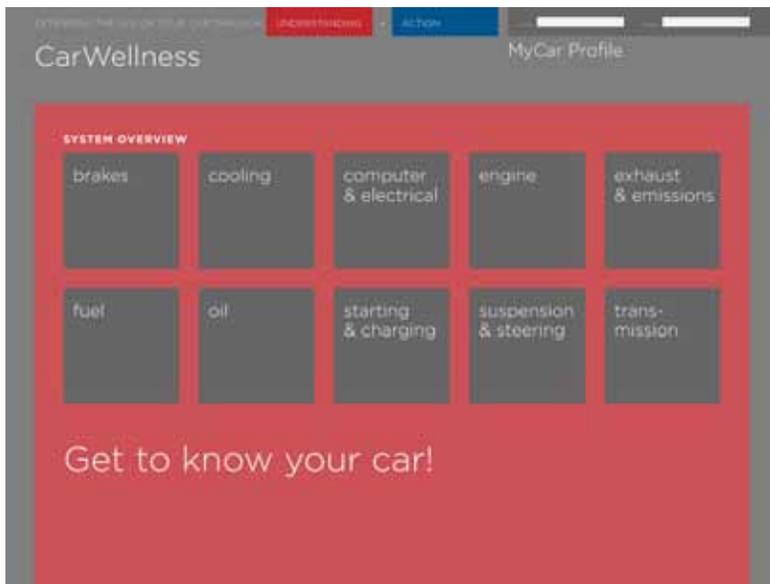
A prototype web application was designed to help personalize car care, simplify communications between parties, and provide service providers with rich databases of knowledge to share with customers constructively and flexibly.

### CONTENT STRATEGY

McCarthy's learning cycle was the basis for the original information architecture in the web application. The various phases would be reflected in each section.

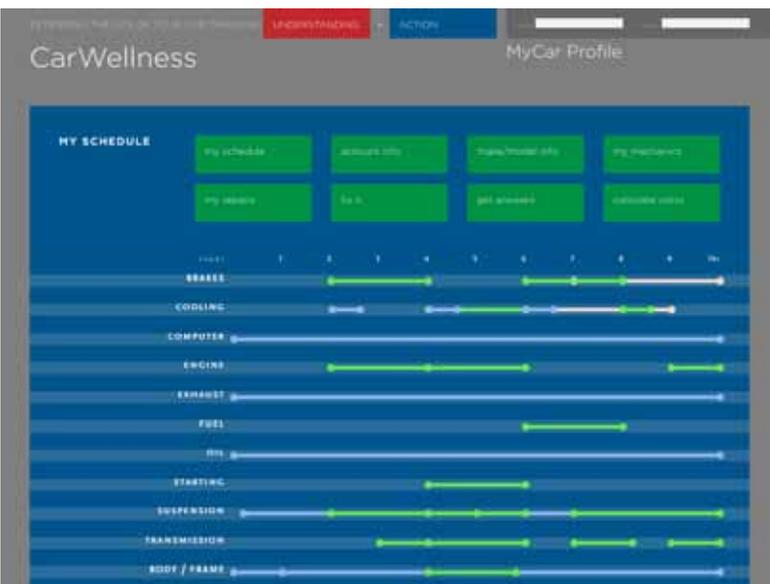
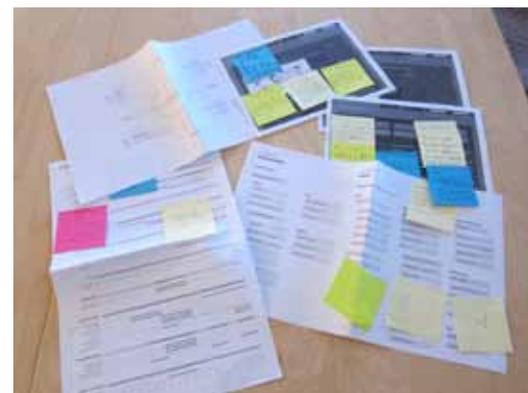
Additionally, key aspects of the service differentiating it from other competitors would include:

- » a neutral, third-party information source
- » visualizations that make budgeting and forecasting possible
- » customization for greater personal relevance
- » appropriate tone: a balance between technical and down-to-earth



GUI Design Development

The content was collected from various internet sources and through conversations with the service provider. Several iterations were explored but the final mapped directly to McCarthy.



## application prototype

### WIREFRAMES & SCENARIOS

Through user interviews, it became very clear that no two car owners are alike. With that in mind, a medium-fidelity prototype of the web application was designed to extrapolate the basic functionality of the system, expressed via unique narratives of how use of the web application would differ among users. Implied in the design is a complex user profiling system which would determine each user's car care personality, adapting contextually to the user's interests and behaviors. Examples of these scales include:

#### gender

MALE FEMALE

#### age of car

NEW OLD

#### experience

NOVICE EXPERT

#### car care attitude

CRISIS MANAGEMENT PREVENTION

#### emotional attachment

DETACHED ATTACHED

#### interest in cars

NONE ENTHUSIASTIC

### SCENARIO 1

Lois, 39

*single-mom  
heavily reliant on vehicle  
stretched income  
limited interest in cars  
procrastinates with service  
doesn't take preventative  
steps*



### SCENARIO 2

Josh, 31

*married  
loves old Jeeps  
enjoys tinkering  
loyal to his mechanic for  
"big" jobs  
keen on DIY community*



### SCENARIO 3

Jess, 25

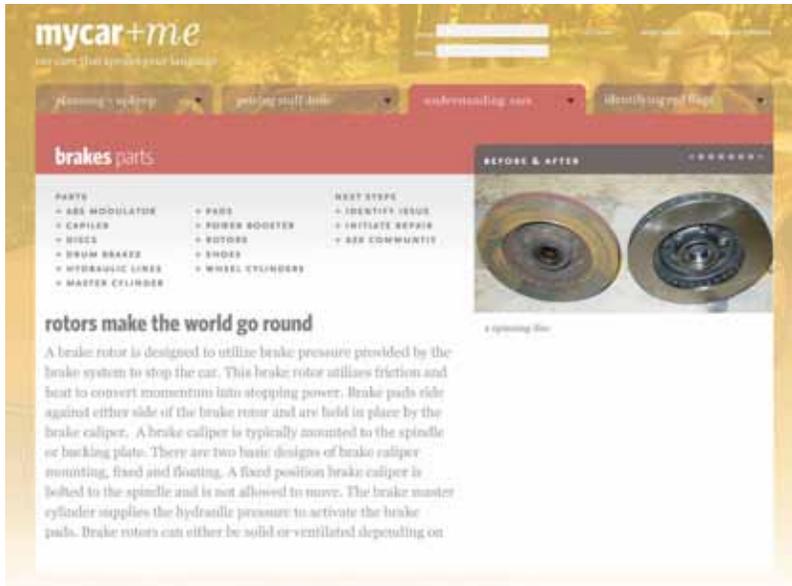
*single student  
8-year-old car needs some  
attention occasionally  
interested in conserving  
and maintaining her car  
unclear on basics*





## application prototype

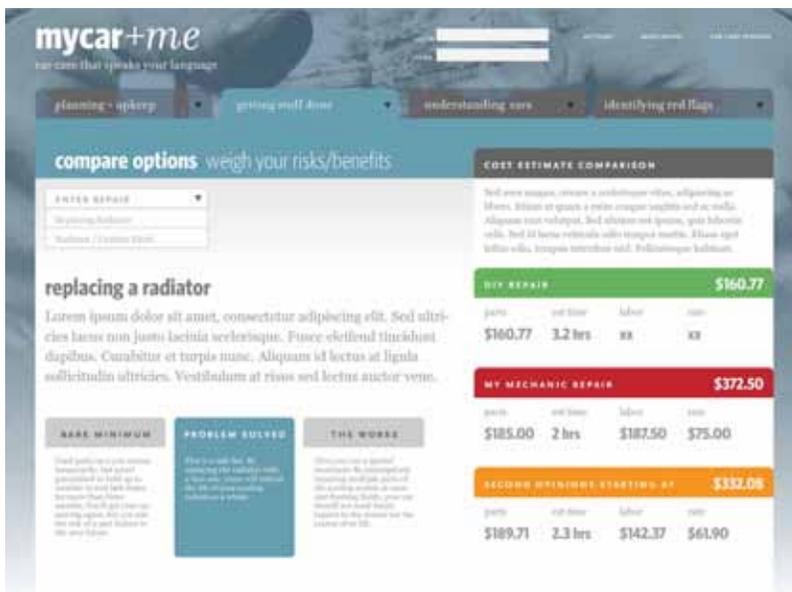
### SAMPLE SCREENS / DETAILS



#### Understanding Basics

*What is it?*

A database containing clearly written “encyclopedic” entries on each and every part and typical repairs.



#### Providing Comparisons

*Why is this important?*

Cost comparisons allow the user to weigh options, acquire second opinions, and determine how the short-term choice may effect long-term outcomes.

#### “MyMechanic” Friendship

*What does it mean to me?*

Similar to the Facebook model of declaring a relationship status, customers can designate an exclusive relationship with their mechanic which opens up a separate feature set to service providers, controlled by the customer.

**Planning Tools**

*What does it mean to me?*  
Personalized care information

**Understanding Tools**

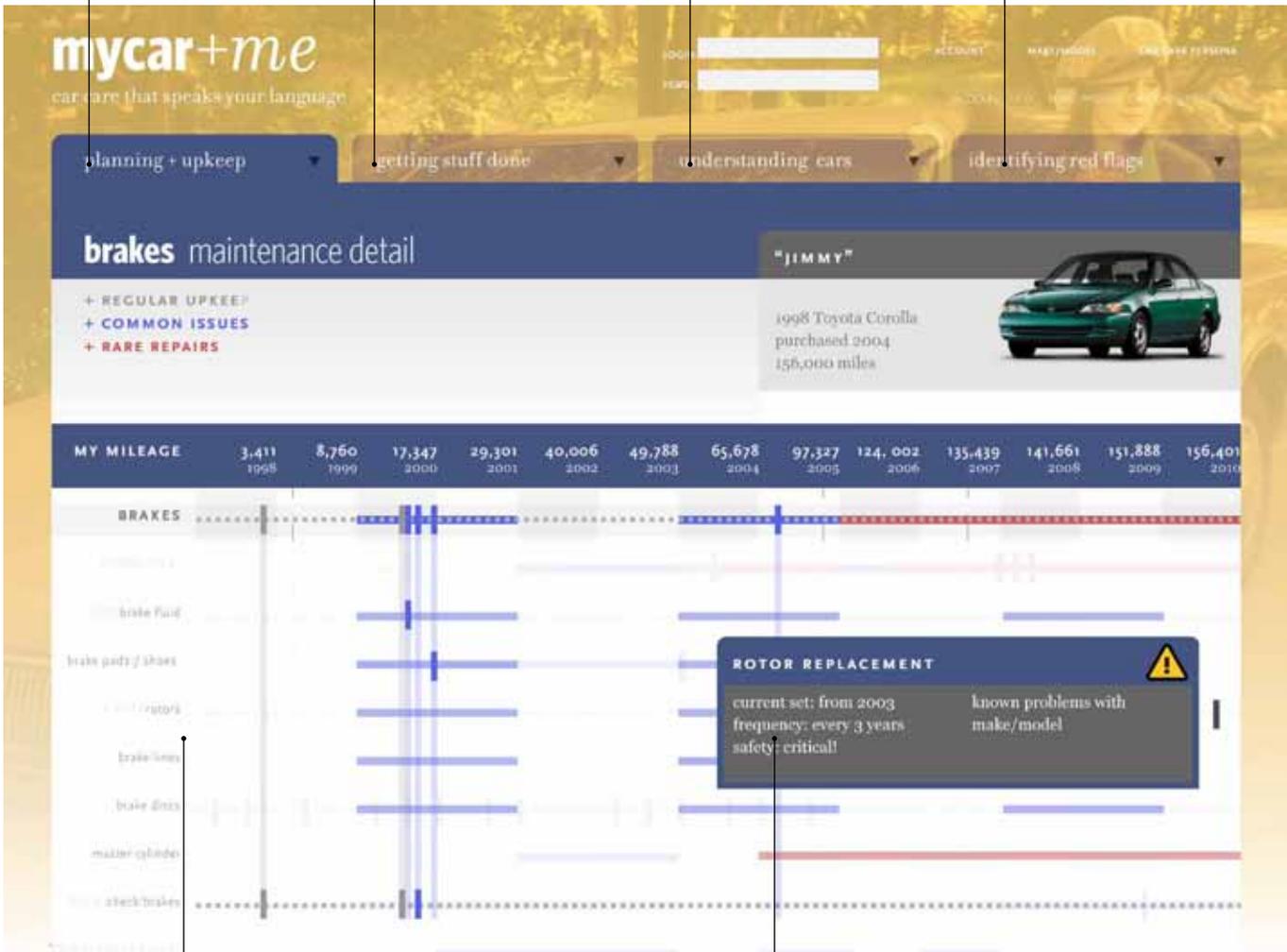
*What is it?*  
Compelling explanations

**Action Tools**

*How does it work?*  
Opportunities for engagement

**Identification Tools**

*Why is it important?*  
Easy-access diagnostic methods



**Personalized Visualization**

*What does it mean to me?*  
A primary impetus for the prototype relates to the visualizing of car care data that puts the user in control of the information.

**Alerts / Communications**

*Why is it important?*  
Users expressed great interest in a simpler communication system that would send reminders, critical alerts, simplify appointment scheduling process, and integrate repair records.

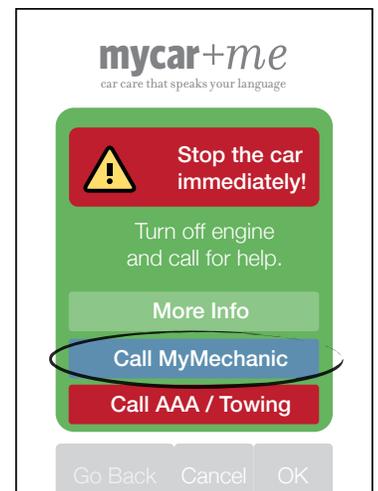
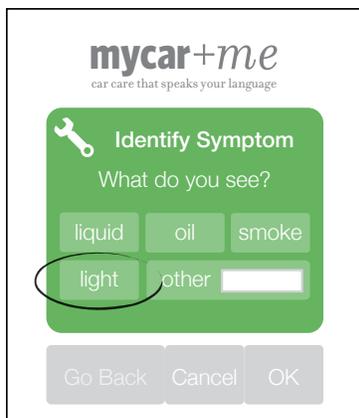
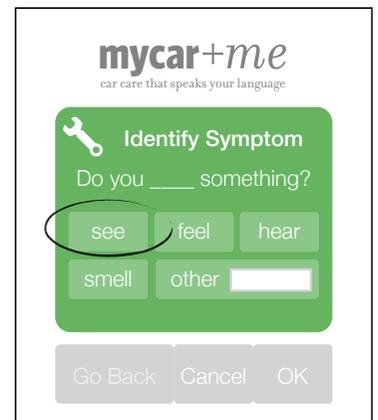
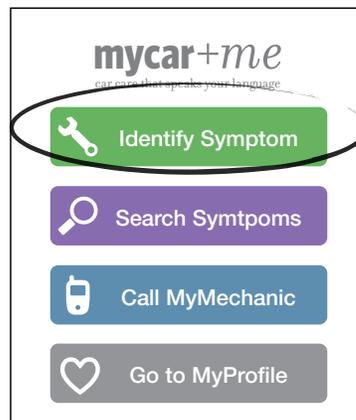
## application prototype

### MOBILE COMPONENT: A DIAGNOSTIC TOOL

An additional everyday learning context exists that would extend the service experience into the car owner's vehicle. Often one might notice a sight, sound, smell or sensation that's difficult to describe verbally. Tracking instances of a problem or the circumstances surrounding an occurrence is also hard to capture. *mycar+me*'s mobile application would allow users to analyze their experience and would give step-by-step instructions for identifying red flags in the moment, when the information is relevant.

### WIREFRAMES

The screens represent steps in a sequence of interactions in a typical scenario of use.



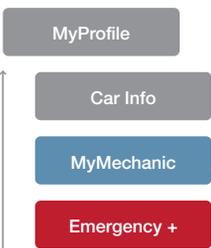
**INFORMATION ARCHITECTURE**

The two primary features in the application are identifying symptoms and searching for symptoms.

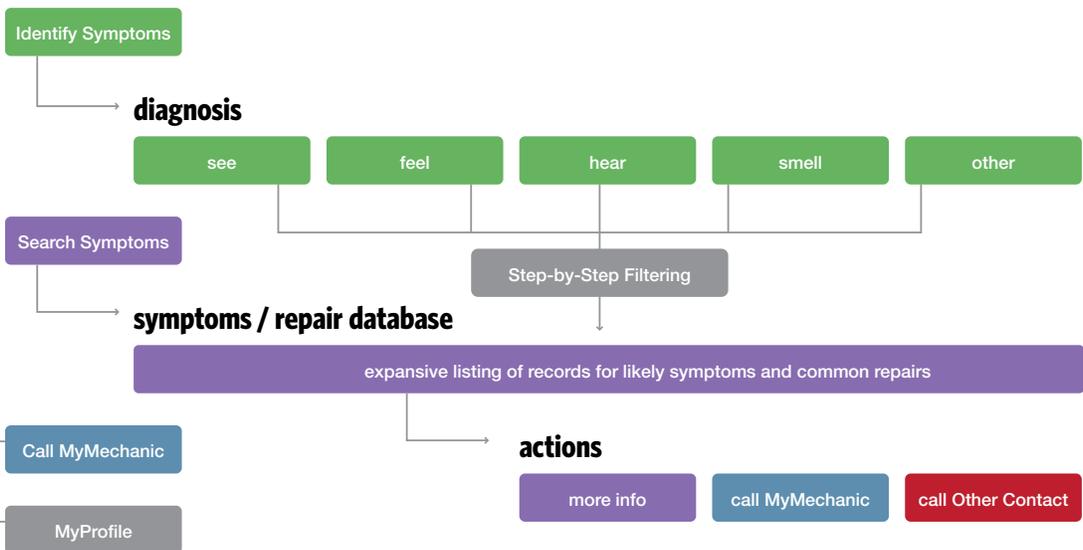
**navigation**



**settings**



**functions / features**



## application prototype

### EVALUATION RESULTS

In addition to the developing the prototype, it was important to evaluate exactly which features were most pertinent to the general population, regardless of the look and feel of the application. A feature analysis survey was distributed to over 60 individuals. Interestingly, the make up of the survey respondents was composed of people who identified themselves as 41.8% Imaginative Learners (those who prefer learning by feeling/watching, then making connections) and 45.5% Analytical Learners (those who like thinking through ideas and seeking facts). These learners, according to McCarthy, are less likely to enjoy active learning formats like lectures and workshops, which makes them prime candidates for being motivated to use a tool like the *mycar+me* web application.

### LIKELIHOOD OF USE

Would you use a Web App  
to manage car care?

47%

answered yes or probably

Would you use a Mobile App  
to manage car care?

26%

answered yes or probably

Several barriers to use were uncovered during the study, including low usage of smart phones, a lack of time and motivation to use applications, and a preference for depending on a trustworthy mechanic. Nonetheless, several features were rated very highly, as listed below.

### HIGHEST RANKED FEATURES

#### **Personalized Timelines & Forecasting**

- » Historic Timeline – something that shows when past repairs were completed
- » Forecasting tools – something to help users plan for the unexpected, or repairs are likely to come up in the near or distant future.
- » Budgeting tools – something to keep track of how much users have spent on each repair, and for calculating likely expenditures in the future.

#### **Messaging & Communications**

- » Alerts for high-priority repairs.
- » Appointment scheduling and reminders.
- » Messages specific to my vehicle (year/make/model).

#### **Information Aids**

- » Matrix of repair options: “The Works” versus “Typical” versus “Bare Minimum”
- » Matrix of cost comparisons from multiple mechanics (instant second opinions).
- » Step-by-step instructions for diagnosing what a sound/sight/feeling/smell may mean for your car.
- » Step-by-step instructions on how to perform basic maintenance procedures (filling fluids, changing lightbulbs, etc.)

### IMPORTANT FEATURES

- » Encyclopedia of typical parts, costs, and associated repairs.
- » Compelling visual/verbal explanations of how systems work.
- » Forums for asking questions of experts.

## application prototype

### REFINED CONTENT STRATEGY

Given the evaluation, both the information architecture and content strategy were revisited with new insight. The structure was crystallized as a multiple-edition platform. The customer-facing content would structure very differently from the provider-facing side, yet both perspectives would be given equal attention. Furthermore, while the essence of McCarthy's framework and spirit was still inherent in the modes of delivering content, the structure of her four-part system was relinquished in an effort to provide what was accepted as the highest priorities by users. The information architecture shown at right is a streamlined picture of the entire content system.

### NEXT STEPS

- » Refine visualization and functional digital prototype that reflects this new architecture and accommodates many of the new features assessed in the feature analysis survey would comprise the next phase of the project.
- » Focus on transformational information: making car care personal and unique. It's not about how brakes work, but about how the car owner's brakes are doing.
- » Make visualization of past, present and future paramount in the design.
- » Give customers control of the information: make it as feature light or heavy as they prefer.
- » Limit feature set of mobile app to diagnostics and communications.

### database content

#### Repairs Database

#### Conversation Database

frequent conversations

difficult conversations

resolving language barriers

#### Artifacts Database

simplified diagrams

technical diagrams

maps

photos

animated diagrams

videos

#### Workshop Database

#### Event-Specific Materials

The Basics

Emergency / Safety

Young Drivers

Winter Weather

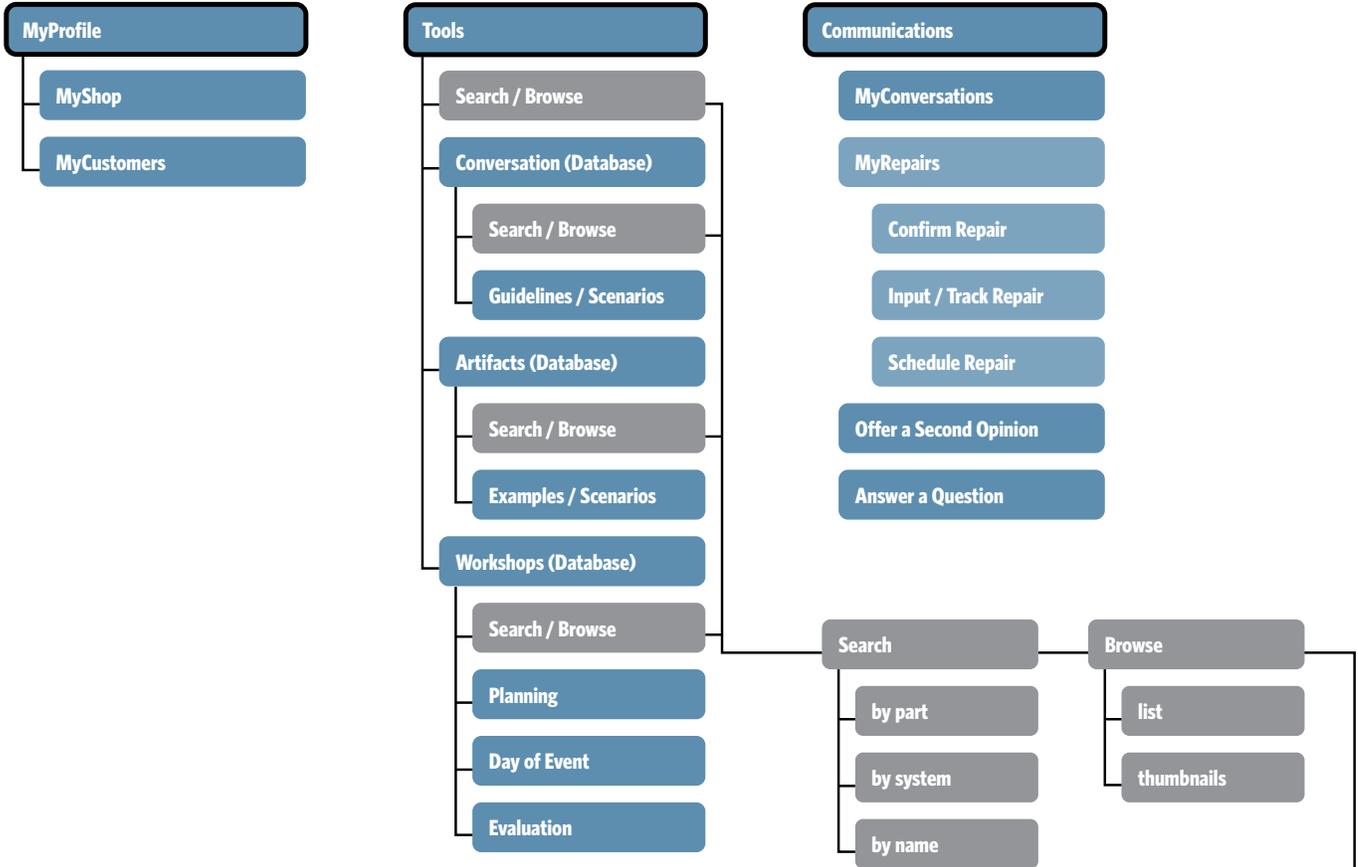
DIY Junkies

Family Day

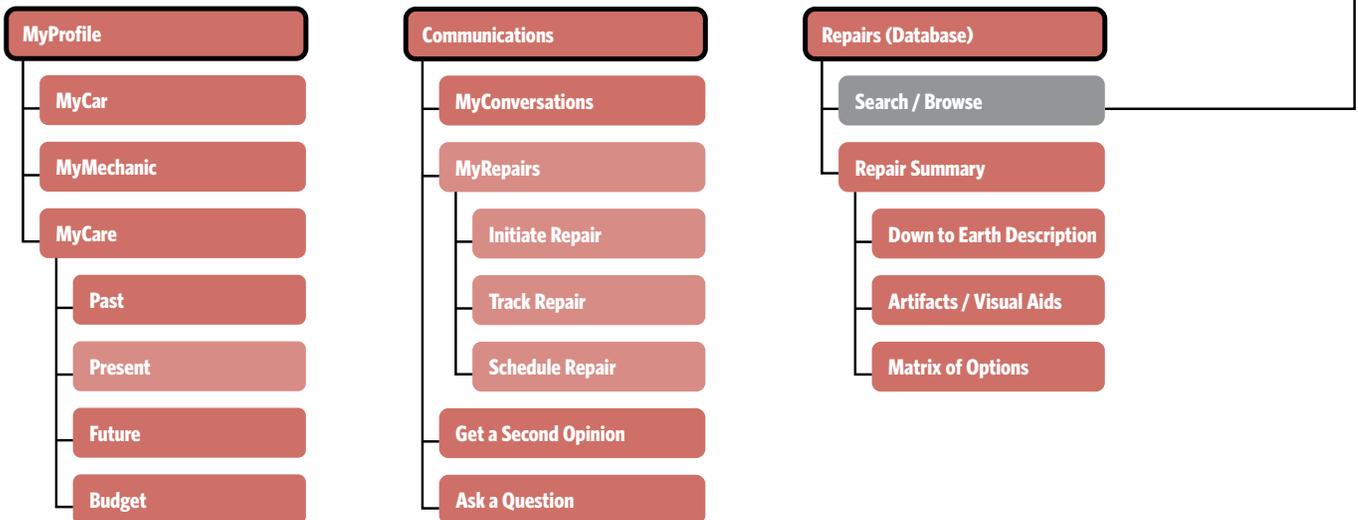
Create Your Own

Teaching Guidelines

**provider edition**



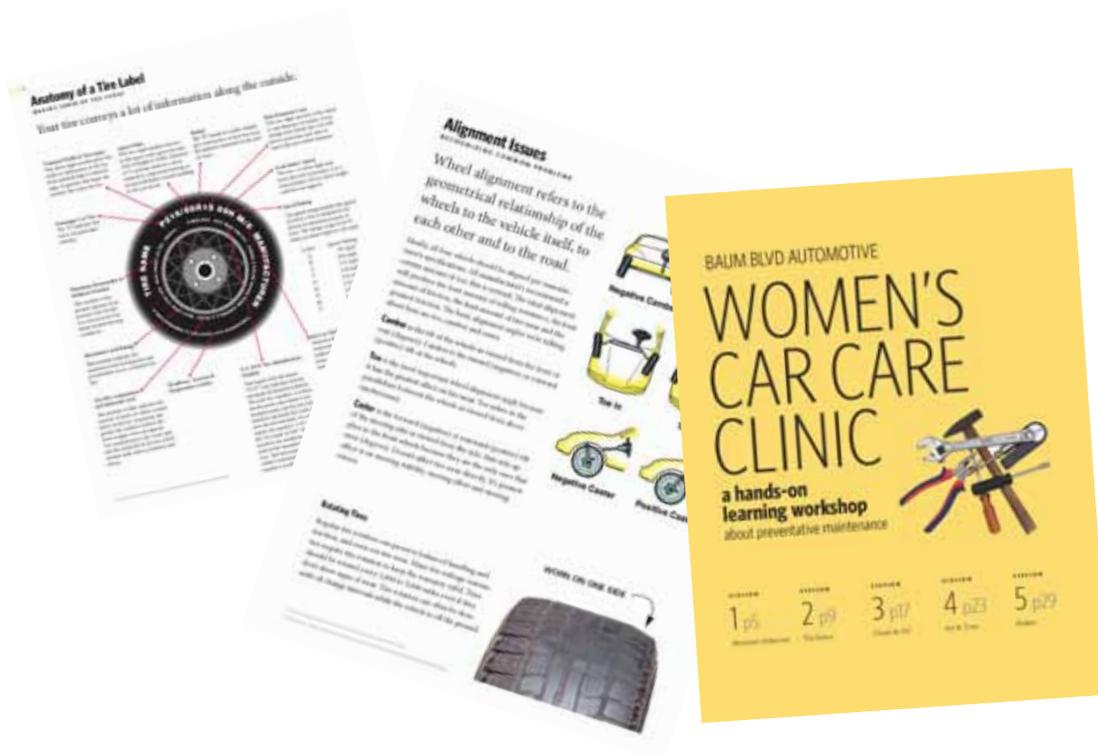
**customer edition**



## workshop prototype

We know that many students don't learn optimally or comfortably from reading a book. For those students, active experimentation is often a preferred tactic for learning. Interestingly, for an expert with tacit knowledge, tinkering is often a natural method for investigation, too.

Car care clinics—informal workshops led by experts to help train others in any variety of related topics—are gaining popularity in the US and are heavily encouraged by after-market organizations such as Car Care Council, because they are a respectable and efficient method for reaching out to the customer community and meeting new clients. They are often framed as events that will improve public relations. While PR may always remain an aspect of any public event where a business opens its doors to customers and strangers alike, there are untapped service “moments of truth” latent in these efforts, namely incredible opportunities for contextual learning in service. The prototype event was designed to be a hands-on learning workshop with greater understanding of car care basics and strengthened trust as the desired by-product.



Learning Guidelines Document

An educational booklet was prepared to correlate with activities and content of the workshop.



## workshop prototype

### STRATEGY & EXECUTION

Live events typically do not go as planned. They are organic entities that ebb and flow depending on participants interactions and circumstances. This table offers a quick look at the prototype car care clinic: what was planned and what happened. Also included are recommendations for future workshops.

### The Plan

<b>audience</b>	<ul style="list-style-type: none"> <li>» Limited to women with little to no experience in basic car care maintenance.</li> </ul>
<b>communications</b>	<ul style="list-style-type: none"> <li>» It was important to impart an accessible tone to both verbal and visual materials.</li> </ul>
<b>content</b>	<ul style="list-style-type: none"> <li>» All content would be framed around McCarthy's learning cycle.</li> <li>» Script was co-designed by designer and service writers to ensure all instructors went over the same material at each station (student engagement was encouraged, and that all four steps of the learning cycle would be addressed in the proper order).</li> <li>» A learning guide was designed to match material covered in the stations, and activity sheets were offered as scaffolding for note-taking.</li> </ul>
<b>environment</b>	<ul style="list-style-type: none"> <li>» Held in the shop, both in the front and back of house.</li> </ul>
<b>facilitation</b>	<ul style="list-style-type: none"> <li>» Goal: test the roles of provider as teacher and customer as learner.</li> <li>» Over the years, the service writers had received customer service training that focused on neutralizing dialogues, dealing with multiple customers at once, and working in stressful environments. Often the recommended or preferred technique in these customer service situations (a.k.a. "moments of truth") involved diffusing overly emotional customers.</li> <li>» In the workshop setting, staff members would test their skills as empathic educators, fielding questions from any category, and working towards giving all students equal attention and care in instruction. Diffusion was to be replaced with empathy.</li> </ul>
<b>format</b>	<ul style="list-style-type: none"> <li>» Adapted from guidelines offered by the Car Care Council.</li> <li>» Six learning stations were planned based on dialogue with the shop staff and the needs of novice audience members.</li> <li>» The workshop would begin with an informal class dealing with high-level issues such as common communication problems between experts and amateurs, with breakdowns into smaller groups, ideally comprised of 5 individuals.</li> <li>» Within the smaller groups, customers/students would have an opportunity to perform hands-on activities, learning best mechanical practices through the application of ideas and techniques, as demonstrated by the technicians/teachers.</li> </ul>

## What Happened

## Recommendations

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>» Culturally diverse and wide range of age represented.</li> <li>» Cliques formed based on those who came together or knew one another.</li> <li>» Shy folks stayed in the “outer ring”; feisty or extra-curious personalities tended to ask more questions, left quiet folks out.</li> <li>» Generally a very active and engaged group; lots of questions offered by the participants.</li> <li>» Some people kept taking calls, sending texts, disengaged.</li> <li>» Everyone ate and mingled afterward (not before).</li> </ul> | <ul style="list-style-type: none"> <li>» Keep audience groups as specific as possible, based on experiences and interests. The small scope keeps individuals comfortable and supported.</li> </ul>   |
| <ul style="list-style-type: none"> <li>» Before the clinic, there was some difficulty in logistics of coordinating script, coming to shared understanding on language, practicing script, etc.</li> <li>» Mechanics looked unhappy/nervous at times. More smiles needed! No welcome message was offered to the ladies as they entered.</li> </ul>  | <ul style="list-style-type: none"> <li>» Instructors should communicate clearly in both detail-oriented segments of the lessons, and in setting the lesson up (e.g. state exactly what is about to happen and why).</li> <li>» All students should start at the same baseline; prepare a curriculum that ensures all participants are presented with the same foundation to build on during the workshop.</li> </ul>   |
| <ul style="list-style-type: none"> <li>» Limited coordination between what was said, what was taught and the activity sheets.</li> <li>» Some overlap or redundancy between stations.</li> <li>» Participants immediately interrupted and asks lots of questions.</li> <li>» Everyone seemed to feverishly take notes (mechanics were surprised by this), clipboards supported it.</li> </ul>  | <ul style="list-style-type: none"> <li>» Instructors should be familiarize content front-to-back, be prepared to explain the information and why it’s been designed in that particular format.</li> <li>» Assume the conversation will veer off based on audience participation, but have the lesson plan/curriculum/script memorized.</li> </ul>  |
| <ul style="list-style-type: none"> <li>» Hard to hear the mechanics (soft spoken, talk fast, acoustics, lots of background noise).</li> <li>» Atmosphere and organization of waiting room was a little awkward (music would have been nice).</li> </ul>  |  |
| <ul style="list-style-type: none"> <li>» Authentic, honest and motivated effort from all the employees; their nerves and style of delivery, commitment to the topic, etc. were charming and confident.</li> <li>» Difficult for the mechanics to shed their personal edge or perspective; their responses became detail-oriented quickly when they could have stayed big-picture.</li> <li>» Some unpracticed comments came off as inarticulate.</li> </ul>  | <ul style="list-style-type: none"> <li>» Consider incorporating another step of facilitation. Train mechanics in basic teaching principles to develop a greater command of material, better tactics for delivery and real-world metaphors for use in comparison.</li> <li>» Memorize the script.</li> </ul>  |
| <ul style="list-style-type: none"> <li>» 15 minute stations too short to cover material; content was too dense to cover, questions were asked by participants to alter course of conversation, experts were long-winded</li> </ul>   | <ul style="list-style-type: none"> <li>» Create opportunities for participation on all levels.</li> <li>» Convert classic “lecture” format into enhanced versions: visual presentation to accommodate hard to see/visualize topics and Q&amp;A panels that resemble more participatory formats such as radio programs.</li> <li>» Make small groups less than 5 individuals to ensure one-on-one attention, time for hands-on activities, and less distancing of shy individuals.</li> <li>» Provide a period of rest or seating options.</li> <li>» Extend the session to three hours.</li> </ul> |

## workshop prototype

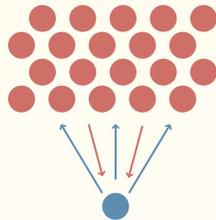
### FORMAT DETAIL

The following diagrams represent the learning formats and interactions designed for and witnessed during the prototype.

### The Plan

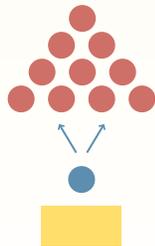
#### informal class

big picture lessons, followed by Q&A

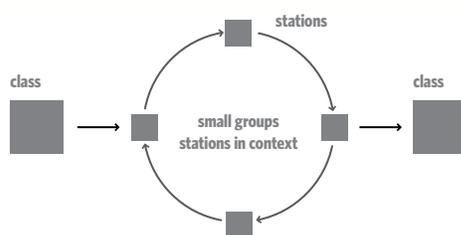


#### small groups

hands-on lessons, followed by Q&A



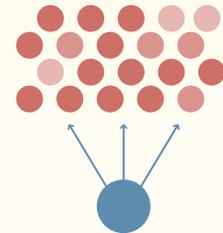
#### format



### What Happened

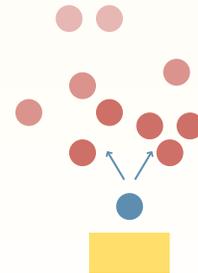
#### informal class

low participation engagement

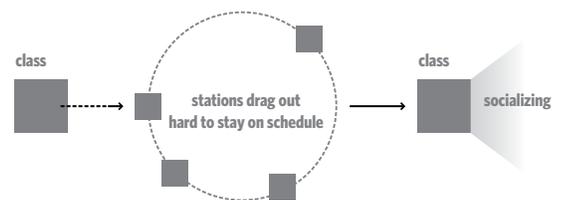


#### small groups

rings of participants formed, hard to stay on track



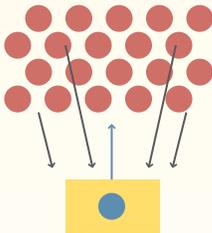
#### format



## Recommendations

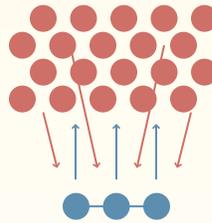
### visual lecture

get everyone on the same page



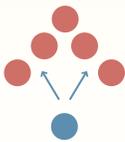
### panel Q&A

loosely scaffolded ad hoc discussion



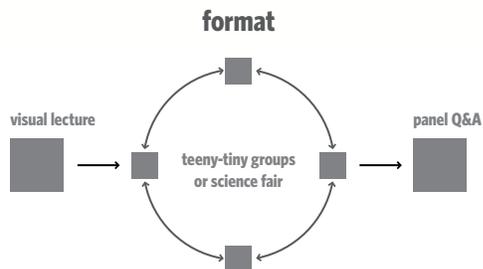
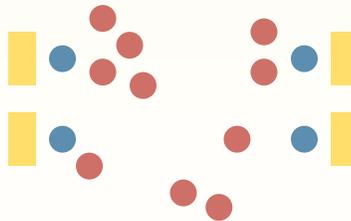
### teeny-tiny groups

hands-on lessons, small scope  
highly participatory



### free-form science fair

learners pick and choose



## workshop prototype

### EVALUATION

Studies were conducted both before and after the workshop to measure success of the car clinic as both a method for learning and an opportunity to strengthen feelings of trust in a service provider. The evaluations were offered as online surveys and were composed of the following categories:

- » **Self-Assessment and Perception**  
exploring preferred learning methods and perception of auto mechanic service
- » **Car Care Quiz**  
testing understanding of basic car care principles, definition of parts, etc.
- » **Service Provider as Teacher**  
understanding strengths and weaknesses of the technicians in their function as instructor and representative of the organization
- » **Customer as Student**  
an exploration and self-assessment of preferred learning methods, confidence and attitude on the organization
- » **Workshop Content**  
a critique of what was offered in the car clinic in terms of informative content and visual tools
- » **Delivery & Format**  
a critique of pacing, length, and level of participation

### Pre-Workshop Research Goals

- » Determine demographics of participants.
- » Determine current learning styles and goals of participants.
- » Measure and test knowledge of car topics before workshop.

### Post-Workshop Research Goals

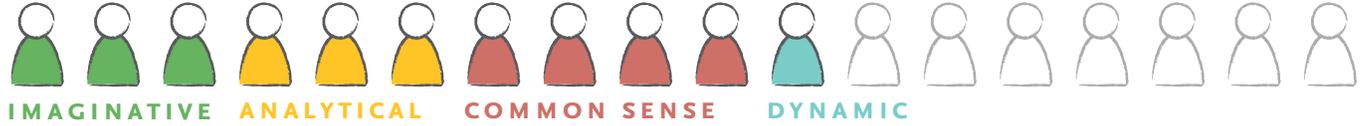
- » Evaluate new knowledge gained via the workshop experience.
- » Gauge preferences in delivery styles, e.g. why was it better to learn one way or another?
- » Measure feeling of “trust” toward instructors
- » Determine success/failure of format (stations, content, groups, etc.)



“I need to connect my mind and body in order to learn something that involves using both, as car care does. Just reading doesn’t help. Just messing with parts doesn’t either. The two in conjunction is the best.”

—FEMALE CAR OWNER, 24, IMAGINATIVE LEARNER

## LEARNING TYPES



## Research Participants

*The group represented in the study was nicely diversified. Preferred learning methods were distributed evenly and the age range was from 18-65. The average rating for understanding basic mechanic principles was 1.71 out of 10. The average rating for understanding general maintenance procedures was 3.36. 50% were existing customers; the other half were new to the shop.*

“I like to be presented with facts first rather than guessing or trial and error... I will remember better if I actually do it myself than by just watching. Otherwise it’s like learning how to swim by reading a book. You have to just jump in and splash around a bit.”

—FEMALE CAR OWNER, 32, ANALYTICAL LEARNER



## workshop prototype

### EVALUATION RESULTS

The workshop was a great success according to personal accounts from both participants and from the owner and staff of the local shop. In fact, 84.6% of participants felt their trust improved or greatly improved in the automotive shop and mechanics as a result of the workshop, which suggests a positive enhancement in the area of cultural trust (experts-to-amateurs). 76.9% of participants felt the behaviors and attitudes of employees strengthened feelings of trust towards the service providers after today's workshop. Additionally, aspects of live instruction (first-hand explanations from the mechanics) were rated very useful by 8 out of 10 participants, suggesting that interpersonal trust played a role in enhancing the experience of learning.

### ON TRUSTWORTHINESS

“The owner and all the mechanics seemed not only very knowledgeable but also very willing to share their knowledge which inspired my trust. They also seemed very friendly, courteous and respectful, as well as willing to answer all our questions.”

—FEMALE CAR OWNER, 33, ANALYTICAL LEARNER

### ON COMMUNICATION WITH PROVIDERS

“We talked about presenting the mechanic with symptoms versus asking for a part replacement. I always felt like I had to figure out what was wrong myself before I brought the car in, because if not, I'd be swindled.”

—FEMALE CAR OWNER, 34, DYNAMIC LEARNER



Social Media Response

On Facebook, after the workshop, several participants added the local shop to their “Likes,” posted to the shop’s wall with gratitude, or posted to their Facebook walls with comments about their experience.

### ON THE PARTICIPATORY FORMAT

“It was refreshing to be able to ask questions without feeling stupid, as it was understood that we were all pretty unknowledgeable.”

—FEMALE CAR OWNER, 27 ANALYTICAL LEARNER

“It was fun to be with diverse women. I liked that we could shout out questions, although that would sometimes derail the agenda, but nice to see other women have same questions/experiences.”

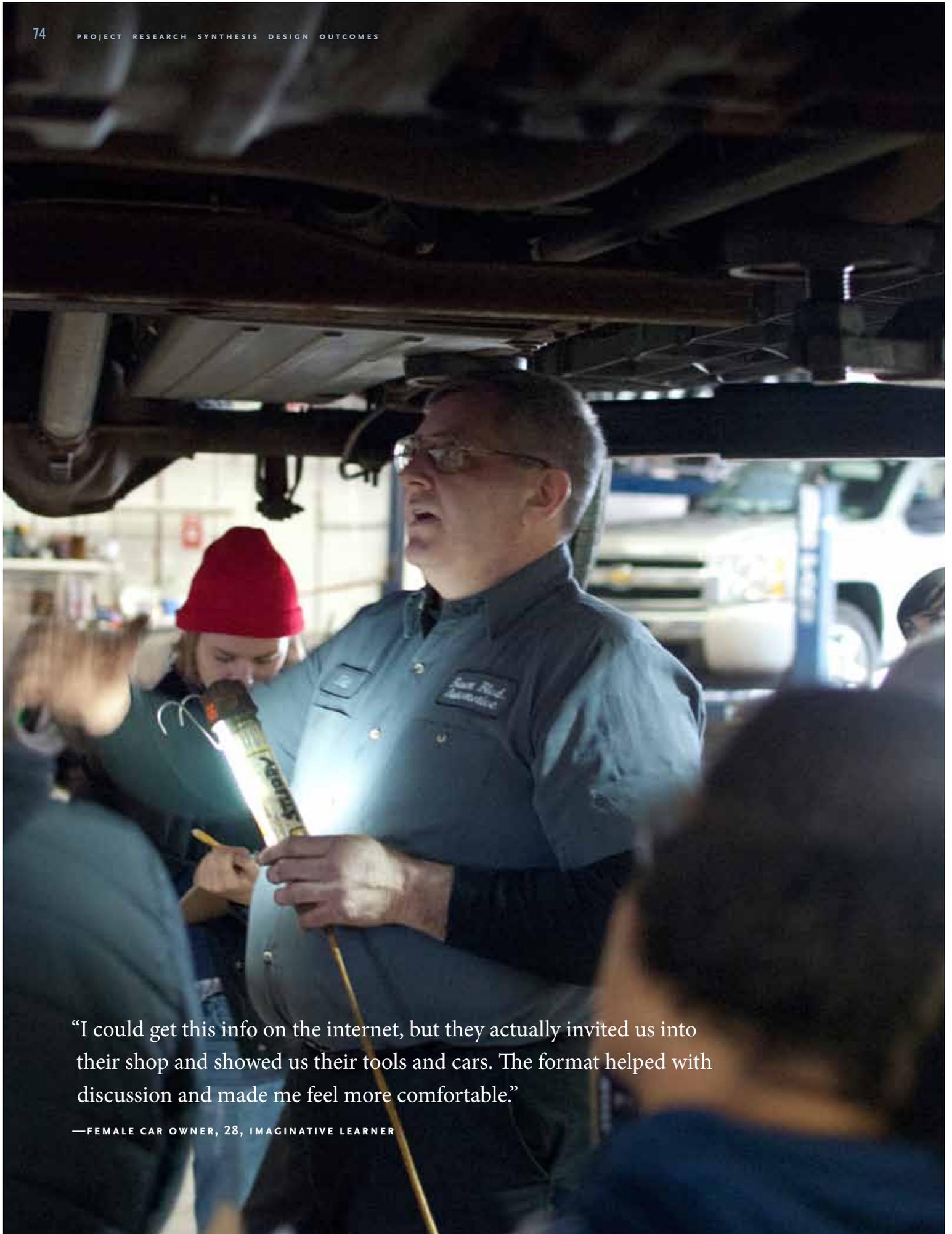
—FEMALE CAR OWNER, 28, IMAGINATIVE LEARNER

“I found the social interaction aspect particularly useful, because many of the other women asked questions that were also helpful to me, but that I hadn’t thought to ask. It also made me feel comfortable asking questions myself.”

—FEMALE CAR OWNER, 34 , COMMON SENSE LEARNER

### NEXT STEPS

- » Develop second iteration of workshop that incorporates refined educational materials and adjusted learning formats.
- » Draft content for additional workshops that move beyond basic content.
- » Orchestrate training for service providers in areas of empathy, design thinking, and teaching.



“I could get this info on the internet, but they actually invited us into their shop and showed us their tools and cars. The format helped with discussion and made me feel more comfortable.”

—FEMALE CAR OWNER, 28, IMAGINATIVE LEARNER

# 5

## OUTCOMES

Identifying big ideas, life lessons, and next steps.

REFLECTIONS	76
CONCLUSION	80

## reflections

### PURPOSE

The purpose of this study was to explore the role of informal learning as a channel for improving technical service experiences and communications. The prototypical studies were designed to measure whether customers can learn from providers in context with supportive and well-designed programs and artifacts. Secondary goals included determining how and why learning in context with providers as facilitators leads to strengthened relational bonds of trust between the parties.

### SUCCESS

The *mycar+me* system stands to greatly improve communications between providers and learners if fully realized and implemented. The four-part system accommodates a wide range of user needs, offering experiential and transformational learning opportunities with an underlying humanistic approach in terms of tone and content. The web application prototype showcases a robust framework of content that would greatly support independent service providers on a quest to refine their relational service model and to advocate for their customers. With a marginal investment of time, customers would reap the benefits of the system, including declaring an exclusive consumer friendship with their mechanic and connecting in-the-moment, face-to-face experiences with a virtual service environment offering accessible, personalized supports.

Through the course of the study, some related issues or branches were uncovered but were not addressed, including:

- » How does one motivate adults into being preventative car care owners?
- » How does one codify intangible emotions in research, such as trust? Trust was not measured outright in the evaluation of the web application. To do so would also require time; trust is not an entity that grows over time. A longitudinal study measuring growth of trust over time would be most beneficial.
- » How might sensor technologies play a role in making car care more seamless? How could human traits like procrastination be mediated through technologies that take emotion, interest and motivation out of the equation?



### GENERALIZABLE KNOWLEDGE

Technical services all share one generalizable truth: the content, expertise, skills and equipment are often so specialized that anyone without formal training in the area is at a loss for deep comprehension of the material. Given the complex nature of the service, customers often end up high costs and only a cursory understanding of the behind-the-scenes effort and process it took to implement. For this reason, the case study showcases a small window into the possibilities of service model re-design, and the role that learning can play in that vision.

## reflections

### PERSONAL LESSONS

This study taught me many things I wasn't expecting to learn. In terms of customers, I was surprised to realize that many adults are simply not interested in informal learning when directly asked to comment; they don't care about science or car maintenance. They were fairly blunt about their lack of interest. Also, many individuals expressed an interest in keeping the service environment neutral. They were not thrilled about transforming service spaces into learning environments.

The mobile and web applications didn't appeal to individuals over the age 40 or so. The studies were conducted in a community surrounding Carnegie Mellon University, which is largely technologically savvy — home to many early adopters of new services and products. The feature analysis survey that was distributed nationally suggested to me that there are many individuals who want *less* information, not more. Some customers simply want to cede information control to a trusted service provider.

Lastly, and perhaps most meaningful, my experience getting to know the service providers throughout the course of the project led to great shifts in perception from both sides of the conversation. First, they spoke candidly about their positions as technicians, and how they manage a busy environment. We also discussed the nature of the wicked problem they operate within: trying to run a small, honest shop as part of a larger system of global manufacturers, national franchises, and new technologies. They honor their commitment to the local community and try their best to be honest and careful in their approach.

I was able to successfully integrate design into a business that was unclear of its value when I started. They expressed a willingness to meet and talk with me and a desire to apply my skills elsewhere in their business. They responded to my comments by internalizing what I shared and then promptly taking actions. Products of that intervention were a personal repair blog (maintained by one of the service writers), and a Facebook page—created early into the research process—used as a vehicle for outreach to new audiences. The staff also actively participated in the design of the workshop prototype, enriching the content with accuracy and authenticity.

While the design of services can't be changed automatically or overnight, the shop's willingness to explore new opportunities in their service particularly leaves me hopeful for the role designers can play in service generally — like Herb Simon would say “changing existing situations into preferred ones.”



#### Expanding Digital Presence

The shop owner established a Facebook page during the course of the project. Postings include useful links to informative articles and ideas, often relating to environmental issues. They've also highlighted individual staff members.

A service writer started a personal blog to offer articles about what happens behind-the-scenes at a typical shop.

<http://repairshop.typepad.com/from-the-repair-shop/2011/01/most-people-find-taking-their-car-to-the-repair-shop-an-unpleasant-or-nerve-wracking-experience-one-of-the-reasons-for-this.html>

An excerpt from “From the Repair Shop” Blog Entry by Nathan Bryant, posted 01/11/2011  
Introduction To Communicating With The Repair Shop

Most people find taking their car to the repair shop an unpleasant or nerve-wracking experience. One of the reasons for this is that the customer is largely out of control. They don't know what is happening to their car or why it costs so much. Cars have become extremely complicated; some newer cars do not even have a dipstick to check your oil with anymore. The complexity and cost involved with repairing modern cars makes it necessary to take your car to some kind of specialist. There is a large amount of stress and anxiety associated with a trip to the repair shop, largely due to uncertainty. People don't know what is being done to their car, how much it will cost, or what their car needs. What I would like to do here is alleviate some of that uncertainty about the car repair process. I want people to be better informed about what is going on with their car beyond that sign that says “For insurance purposes, no customers allowed beyond this point.”

A major challenge in auto repair, like most situations in life, is communication. Auto mechanics, like most specialists, have their own language which seems to have evolved from English, though the exact origins are unknown. Seriously, who actually uses words such as “dwell, lateral runout, bearing end-play, dry-rot, backlash, and fluid contamination?” Often the moment when the customer is faced with trying to decipher a list of unusual terms is when they are faced with making a decision involving a large amount of money. This is a very bad situation.

My goal with this blog is to empower people to be able to better deal with automotive repairs. First, I want to help people decide what they can do themselves and when it is necessary to trust the professionals. Second, I want to explain what is going on in the back of the shop and why things take time and cost money. Third, I want to try to take some of the mystery out of what the service writer is talking about when he says “your ball joints are shot and it will cost \$600 to repair it.” While I'm not going to second guess specific diagnosis or estimates, I will try to give people the knowledge they need to ask “What is a ball joint and how did you determine that it is bad?”

## conclusion

By integrating learning principles into various touchpoints and across multiple media platforms, experts and amateurs have several methods for bridging the gap in communications that breeds deep mistrust.

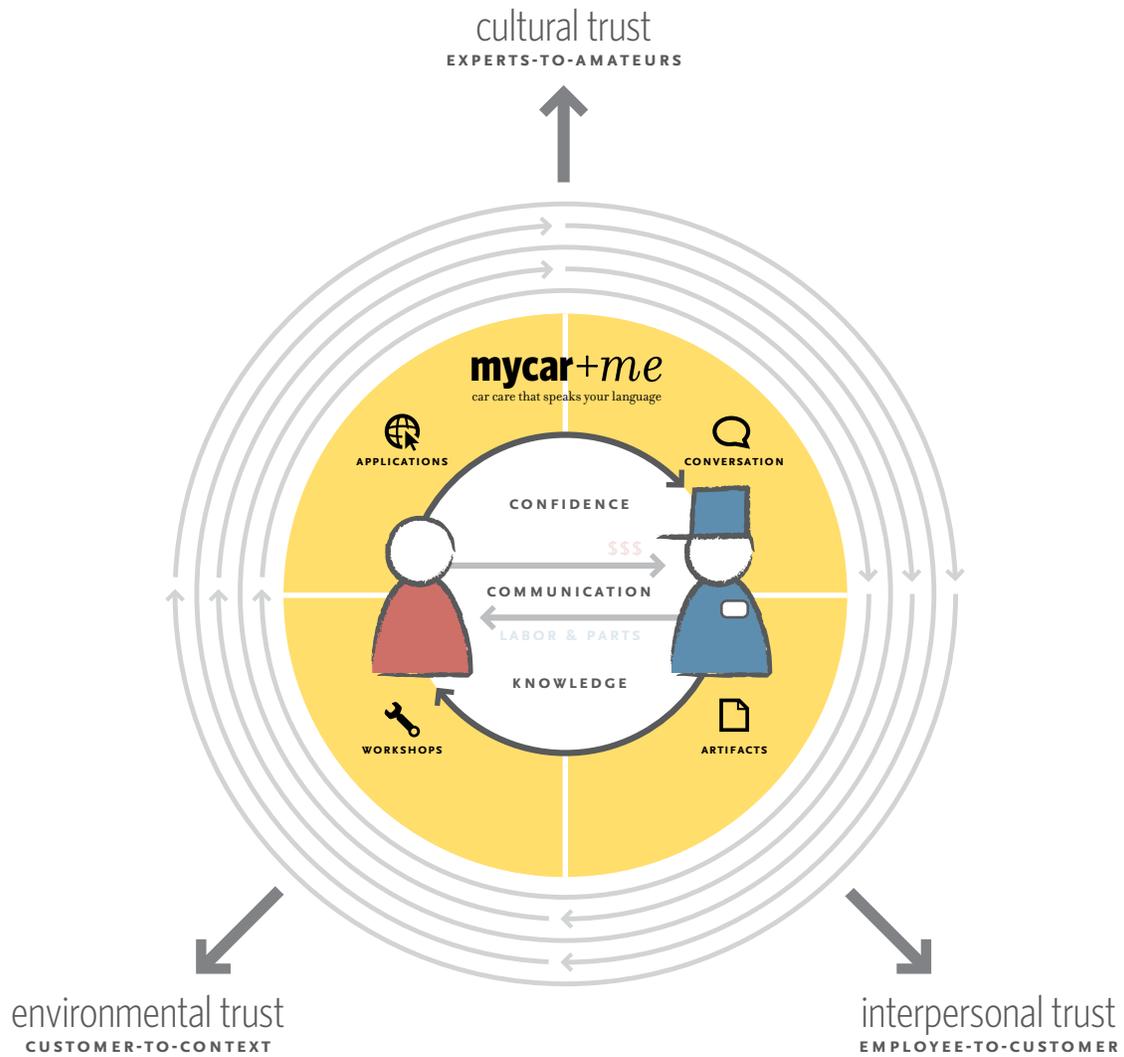
Through this research project, the following conclusions rose to the surface:

- » Knowledge-Sharing supports Understanding
- » Confidence-Building supports Action
- » Both are made possible through a dynamic cycle of learning that strengthens the individual's environmental context — aiding in communication about complex topics.

*my car+me* supports a new model for technical service that aids providers in reshaping their messages to customers. It takes an empathic approach to communication from both sides of the service exchange. It sets providers up with an arsenal of tools to reach all types of customers, including an easy platform for maintaining dedicated relationships. It also offers them the ability to supplement face-to-face interactions with visualizations that clarify what is difficult to express verbally.

Customers, on the other hand, receive access to concise, friendly information when it is most relevant – during their service or as a support to personalizing the car care experience. Repetitive use of the system would empower adult learners with understanding of useful technical issues, supporting greater ease and control in personal, informed decision-making, and lessening anxieties.

Through the prototype evaluation, it is clear that these artifacts and programs have the potential to influence multi-faceted trust on several levels, and from multiple perspectives. *mycar+me* can be used as a framework or model for other technical service providers to deepen their “commercial friendships” with a shared baseline of empathic communications.

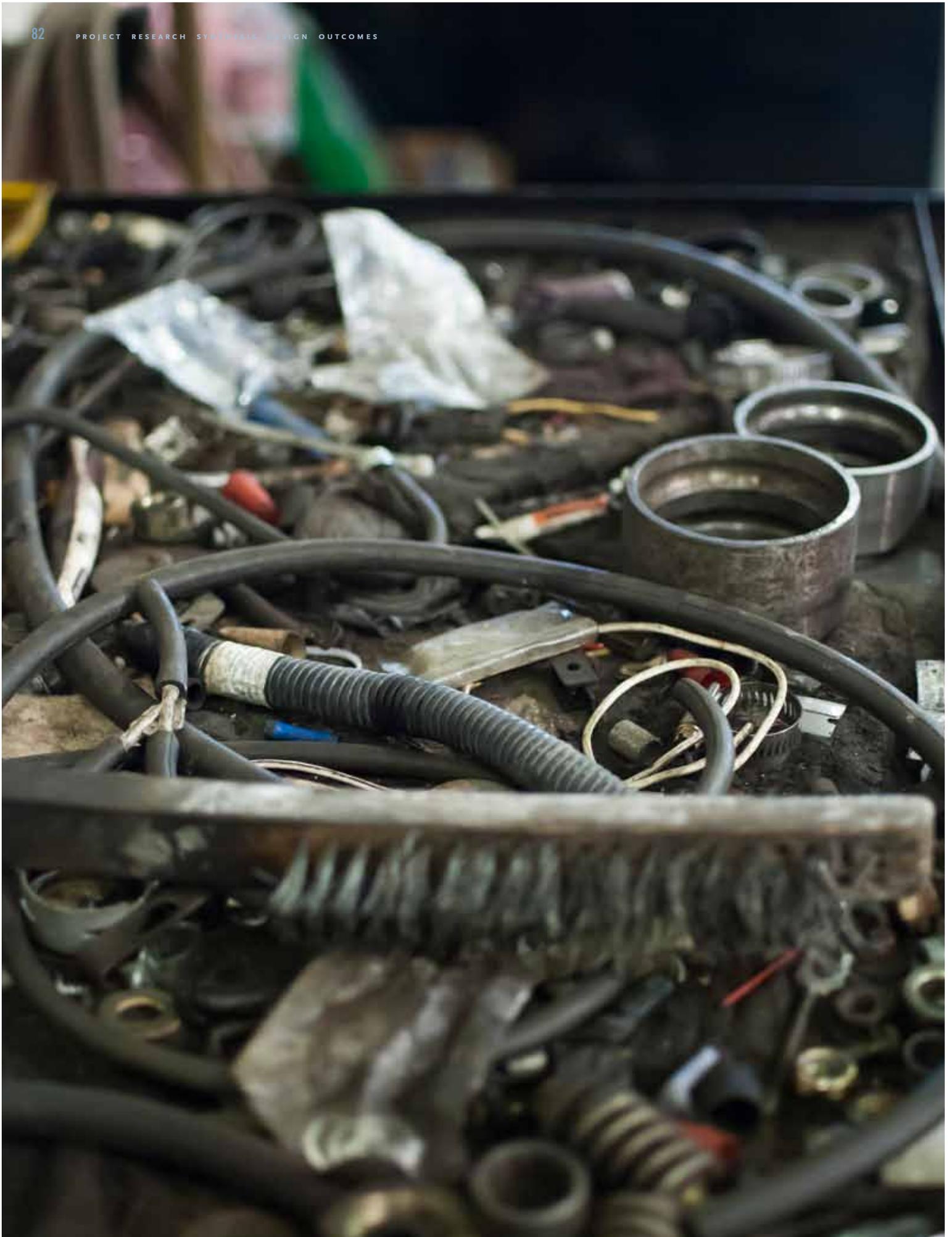


#### Service Model Stage 4

as a by-product of continual use of mycar+me  
multi-faceted trust strengthens

#### FUTURE PROJECTS

- » Explore sensor technology to take active follow-up out of the equation. Consider completely seamless integration between mycar+me and physical automobiles.
- » Test similar studies in a different technical service environment (e.g. medical care) to confirm the ability to generalize findings.
- » Refine design of working prototypes and have users re-evaluate for success.



# APPENDIX

WORKSHOP PROTOTYPE EVALUATION	84
BUSINESS MODEL	86
COMPETITIVE ANALYSIS	88

## workshop prototype

### EVALUATION RESULTS BEFORE THE WORKSHOP

57% trusted the business and 64% respected them for organizing an event like this.

### EVALUATION RESULTS AFTER THE WORKSHOP

Regarding instructors and the industry at large

- » 80.9% felt the instructors presented material in a way that was engaging,
- » 94.8% felt the instructors exhibited knowledge regarding subject material.
- » 96.85% felt the instructors treated all participants with respect.
- » 76.9% agreed or strongly agreed that their impression of mechanic industry at large has been positively effected.
- » 84.6% felt their trust improved or greatly improved in the automotive shop and mechanics as a result of the workshop.

The following components contribute to feelings of trust towards the service providers after the workshop:

- » 69.23% policies / principles of the company
- » 61.54% physical evidence (the shop, the atmosphere, uniforms, etc.)
- » 69.23% communications / materials / artifacts / program
- » 76.92% behaviors / attitudes of employees
- » 69.23% interactions with employees

There was a generally positive trend towards increasing confidence and context (environmental trust), but reservations were expressed about how long the information would be retained. Also expressed was a desire to rely on mechanics to remain experts (ceding control).

- » 84.62% understanding of car science
- » 76.92% understanding of typical procedures, preventative care versus crisis management, and some typical diagnoses/symptoms (sights, sounds, smells, etc.)
- » 100% said they would tell others about their experience.
- » 83.33% Live Instruction: First-hand explanations from the mechanics. very useful
- » 66.67% Accessible Tone: Materials and delivery communicated in a tone that is not intimidating

## UNDERSTANDING CONCEPTS BEFORE AND AFTER WORKSHOP

**What is a timing belt? Why is it important?**

before

after

**Describe how brakes work.**

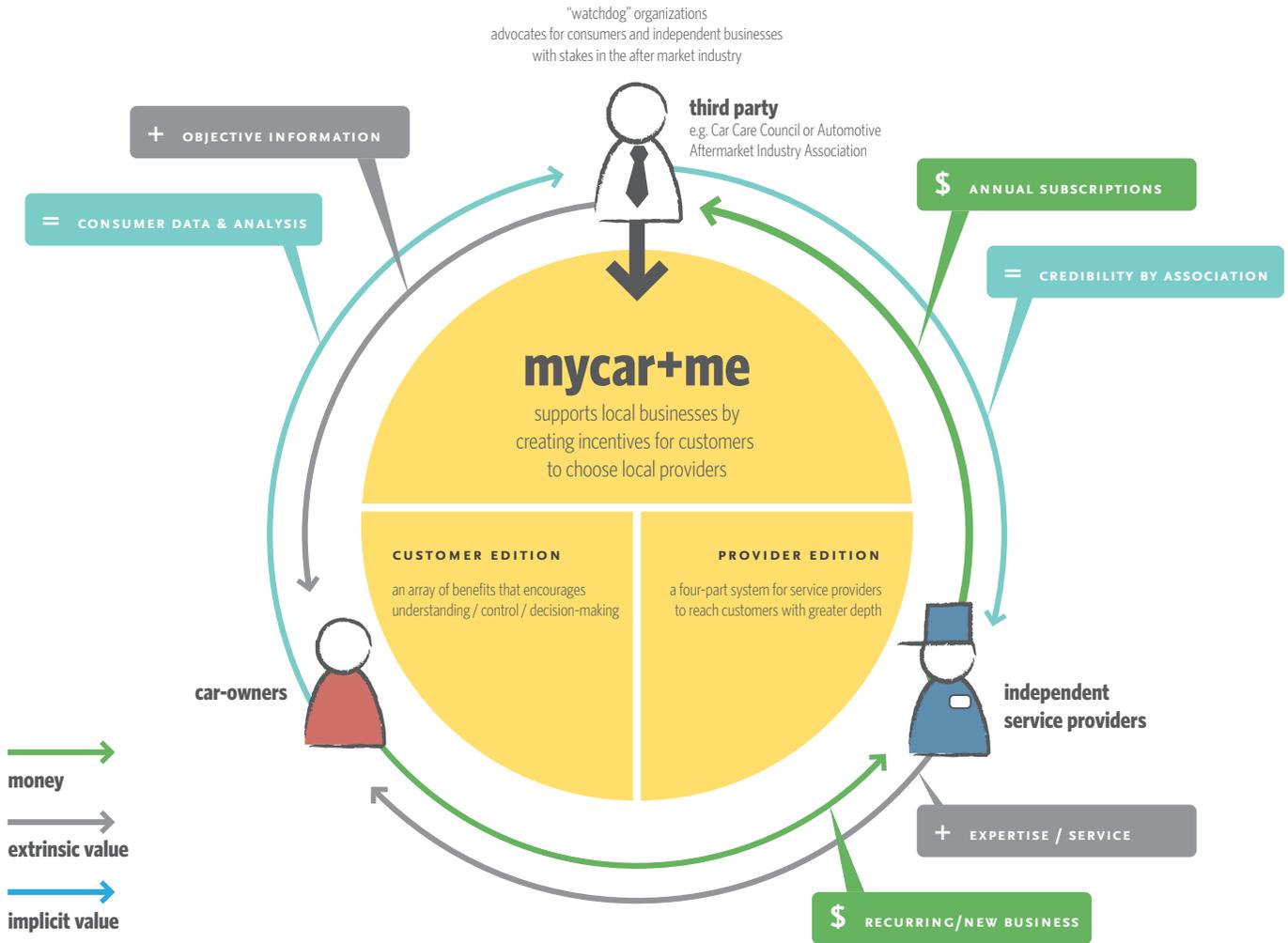
before

after

1	I don't know. I know it should go in about 50,000 miles. It can get loose.	The timing belt is a belt on your engine that keeps the moving parts of the engine moving in the correct time. This is really important because it keeps the pistons from hitting the valves, which would be really damaging.	You press the brake pedal, which applies pressure to the brake pads and rotors, which presses the wheels to make them stop? Friction? Pedal, Brake Pads, Rotors	You use leverage to push on the brake pedal. This uses hydraulic pressure to send brake fluid from your master cylinder to your caliper- the piston is pushed down which then pushes your brake pads into your brake rotors, stopping the car with friction.
2	I think it has something to do with the way the engine runs and is important because it has something to do with efficiency.	Connects lower and upper parts of the engine and has something to do with the working of the pistons and cylinders.	I've no idea.	On disk brakes, the calipers/pads come down and grab hold of the rotor. Friction? This wasn't covered that I remember. Nor were many of the questions above.
3	I know that if it breaks, your car needs towed.	The timing belt connects the camshaft and the crankshaft. It opens and closes the valves in the engine.	No idea.	The driver presses the brake, brake fluid flows to the pistons which push out the calipers. The calipers push the brake pads against the discs to slow down/stop the car. The parts needed are brake fluid, pistons, calipers, brake pads and brake discs.
4	I don't know.	The timing belt sends the trigger to the pistons to open so that the engine can receive fuel.	The rotor surface accepts the brake pads. When the brake is depressed the pad presses on the rotor causing friction allowing the car to slow down or stop.	Front brakes and back brakes work differently. Front brakes use pads that compress against a rotor while the back brakes are depressed using a brake fluid depression system.
5	I have no clue	Its on the engine. It makes all the pistons and valves move at the same time	press break pedal, causing brake pads around the wheel to clamp/tighten. Friction causes wheels to stop. screeching sound comes from rust on the breakpads? I don't know :/	leverage, hydraulic, friction: for a disk break: press break pedal, pushing break fluid into that thing that starts with a C which wills with break fluid pushing piston out, putting pressure on breakpad which is actually stopping the wheel. Drum break works differently.
6	I have no idea.	It is a belt on the side of the engine that syncs the valves/spark plugs at the top of the engine with the pistons at the bottom of the engine, and ensures they are all operation in correct succession.	When you press on the brake pedal, the brake drums (?) will clamp onto your tire. This brings the brake pads in contact with the tire, using friction to slow down the tire rotation and slowing your car down.	When you apply pressure to the brake pedal, the brake pads clamp onto the rotors and slow the car with friction. In some cars, the rear tires have pads which push out on the rotors to slow the tire rotation.
7	I have no idea!	the timing belt connects the top and bottom halves of the engine and keeps the pistons and valves synchronized	not a clue	pressing on the brake pedal sends brake fluid through hydraulic tubes which go to the front and back tires. The pressure from the brake fluid forces the brake disc out on the tires allowing the brake pads to clamp on the disc slow down the tires.
8	Don't know	It works in the engine to make all the gears work	don't know	Fluid goes into the wheel, pushing out the pads against the rotors to stop the car.
9	I don't know	Don't recall which of two belts it is-- I think it's one in the engine that allows the bottom of the engine to power the top of the engine and move the valves which release exhaust from the combustion caused by the spark plugs	pads grip part of wheel	pads grip rotors, break fluid in rubber tubes does something...
10	NO IDEA.	It is a belt inside of/attached to the engine which keeps the top and bottom part of the engine moving together so that the valves and pistons do not smash into each other causing damage to the engine.	An item presses against either some part of the wheel or something attached to the wheel to slow the wheel down.	There are two types of braking mechanisms which slow down the car. One type uses a "shoe" which pushes in on the rotor from the inside to slow its movement and thus the speed of the wheel. The other type uses a caliper which grips the rotor to slow its movement.
11	not sure. just know they break!	A timing belt attaches to the side of the engine and controls how often the fuel is ignited to power the piston, which creates power for the engine (I think!).	Not sure.	the calipers/shoes grip the rotors, which slows the wheel down.

## business model

From a macro view, *mycar+me* is designed to provide various types of values to all involved stakeholders through an integrated system of knowledge sharing. The system operates on the notion that a third-party entity, such as CarCare.org or AAA, with a vested interest in a fluid and competitive after-market industry, would operate and publish the software and content. The idea is that they are an advocate for well-informed consumer population, but they also represent a common source of assistance toward small independent shops who need an informational support network outside of their typical manufacturer-dealership-part supplier cycle. In essence, the third party supplies *mycar+me*, thereby supporting local businesses and creating incentive for customers to choose local businesses over dealers. Customers receive an array of benefits that encourage understanding and control in decision-making. Providers receive a four-part system to reach customers with greater depth.



Value Mapping

This diagram illustrates how various forms of value are being exchanged in the system.

## competitive analysis

Although several tools exist on the market, *mycar+me* includes key features the competition fails to meet, as shown below.

Marketing	MyCar&Me	AutoMD
tagline	» “car care that speaks your language”	» “shifting the power to you”
objective	» supporting understanding and aiding in action-taking to foster trust in mechanic-customer relations	» empowering customers with the “best way to repair the car”
business model	» provider membership / subscriptions	» advertisements
<b>Select Features</b>		
diagnostic tool	✓	✓
visual encyclopedia of parts / systems / repairs	✓	✓
mobile application	✓	✓
third party estimates & opinions	✓	✓
accessible tone & language down to earth descriptions	✓	✓
robust and dynamic personal car care timeline	✓	
budgeting / forecasting tools	✓	
electronic communications with mechanic	✓	



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