

AFD Ep 362 - Project Cybersyn in Allende's Chile [Bill/Rachel] - Recording April 4

- This week's episode returns to some core themes of our program: Central planning and economic administration in an industrial economy using new technology – and the political values or outcomes of technological systems. In this case, in an echo of our episodes on paper, typing, and printing advances of the second industrial revolution, we'll be talking specifically at great depth about a demonstration of similar principles at the dawn of the third industrial revolution: the unfinished Project Cybersyn program in Chile during the democratic socialist government of 1970 to 1973. As we covered in a recent episode on the Church Committee, that political experiment ended in a violent, US-backed military coup. But before then, a small circle of Chilean engineers, planners, and politicians were engaged in an ambitious plan to design and build with very limited physical capital resources a 1970s national computing network to assist in leftist economic planning without a revolution. It never really got a chance to prove itself before being literally destroyed after the coup, but it's one of the big What Ifs of the history of leftist political and economic experiments thwarted by US intervention.
- [Rachel] Background on Allende and the political situation c.1970-73 [taken from Chapter 2, mostly]
 - Salvador Allende Gossens was a medical doctor who became a socialist at 24 because he saw the plight of the poor. He co-founded a branch of the Socialist Party in his hometown, and quickly rose through the ranks of the Party. He was elected to Congress in 1937, and was named Minister of Health in 1939. He was elected to the Senate in 1945. He ran for President in 1952, '58, '64, and '70. He won a plurality of votes in a three-way race in September 1970 running as the Popular Unity candidate, narrowly edging out the right-wing former president Jorge Alessandri. The UP comprised a coalition of the Chilean Left: the Socialist Party, Communist Party, the Radical Party, Social Democrat Party, the Independent Popular Action and the MAPU (Movimiento de Accion Popular Unitario). The Constitution stated that in the case of no majority winner, Congress voted between the two candidates with the most votes. Allende allied with the Christian Democrats, because they both backed structural social and economic change.
 - At this point, the capitalist class went into overdrive trying to prevent Allende from assuming office. Nixon met with Kissinger, Pepsi Cola chairman Donald Kendall, Attorney General John Mitchell, and Augustin Edwards, owner of right-wing newspaper El Mercurio and a Pepsi Cola bottling plant. Edwards asked the Nixon administration to assist in efforts to stop Allende from becoming president. And as discussed in the Frank Church episode, the CIA and ITT were involved in the assassination of General Rene Schneider, who believed that the role of the military was solely to protect Chile's sovereignty, and that they should stay out of politics. Allende assumed the Presidency in November 1970, with the support of the Christian Democrats. The USA continued to interfere with Chile, creating an "invisible economic blockade", and spending \$8 million on initiatives destabilizing the Allende government.
 - Allende wanted to implement change through democratic processes, not by force. He wanted to use popular sentiment to push through economic and social reforms; it would be a revolution with the taste of "red wine and empanadas".
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- Government central planning by computer and algorithm:
https://en.wikipedia.org/wiki/Project_Cybersyn (also known as "Proyecto Synco" in Spanish for *Sistema de Información y Control*)

- The book I read for this episode is called: **“Cybernetic Revolutionaries: Technology and Politics in Allende’s Chile”** by **Eden Medina (MIT Press, 2011)** and it’s a fascinating look at the Allende years in Chile through a very specific, narrow lens that gives a lot of unusual insights into that period, sometimes even down to the day by day events. It covers a project that involved some of the people from Allende’s inner circle but was never really a core part of the peaceful revolution in Chile or the Allende government, which gives the reader a new window into the big picture things happening around it. And interestingly, as noted in the epilogue, one of the highest-level members of the Allende government (Mining Minister Sergio Bitar) wrote a semi-official insider account in the mid-1980s of what had gone wrong inside the Chilean revolution (as opposed to the external factors of the coup and US interference) and used cybernetic theories to explain his analysis, which he had gathered from Project Cybersyn leaders he was imprisoned with after the coup and they were reflecting together on everything that had happened.
 - Book summary from the back:
 - <https://mitpress.mit.edu/books/cybernetic-revolutionaries>
 - *In “Cybernetic Revolutionaries,” Eden Medina tells the history of two intersecting utopian visions, one political and one technological. The first was Chile’s experiment with peaceful socialist change under Salvador Allende; the second was the simultaneous attempt to build a computer system that would manage Chile’s economy. Neither vision was fully realized—Allende’s government ended with a violent military coup; the system, known as Project Cybersyn, was never completely implemented—but they hold lessons for today about the relationship between technology and politics. Drawing on extensive archival material and interviews, Medina examines the cybernetic system envisioned by the Chilean government—which was to feature holistic system design, decentralized management, human-computer interaction, a national telex network, near real-time control of the growing industrial sector, and modeling the behavior of dynamic systems. She also describes, and documents with photographs, the network’s Star Trek-like operations room, which featured swivel chairs with armrest control panels, a wall of screens displaying data, and flashing red lights to indicate economic emergencies.*
 - The book is based on more than 50 interviews with people connected in some way to the project and on the personal files and records of four people. It was researched over more than a decade.
 - Preface: *“Nor was Project Cybersyn just any technological system. It was conceived as a real-time control system capable of collecting economic data throughout the nation, transmitting it to the government, and combining it in ways that could assist decision-making. That was at a time when the U.S. ARPANET, the predecessor of the Internet, was still in its infancy, and the most technologically advanced nations of the developed world were still trying to build large-scale real-time control systems. [In fact the Soviet Union had already tried and failed to build a national computer system for managing a planned economy, mostly for political turf war reasons.] By 1970 Chile had approximately fifty computers installed in the government and the private sector, most of which were out of date, whereas approximately 48,000 general purpose computers were installed in the United States at the time. However, those involved in Project Cybersyn believed that cybernetics, the interdisciplinary postwar science of*

communication and control, would allow them to create a cutting-edge system that used Chile's existing technological resources."

- Some notes on this aspect, but drawn from chapter 2: I think it should be noted that Chile had fewer than 10 million residents in 1970 and a decent level of computer literacy among both private corporate administrators and the state administration. But the US Commonwealth of Puerto Rico alone with 2.7 million residents had about 300 computers to Chile's 50. In Chapter 2, the author emphasizes that the preceding presidential administration under the Christian Democrats had not only begun laying the groundwork for industry nationalization but more importantly for this specific subject they had been laying important groundwork for the Chilean state to be heavily involved in computer mainframe technology and incorporating it into the administration of the state and by extension the state-owned economic sectors, which the Christian Democrats also favored. But the Christian Democrats had used computers to crunch numbers faster and prepare annual reports, not for real-time feedback or modeling scenarios. The Christian Democrat government also found itself unable to acquire multiple mainframes for reasons relating to supply and international credit, so those limiting factors pushed Chile in the direction of centralization of computing resources, rather than a more distributed network we would be more familiar with today. When the Allende government launched Project Cybersyn, they not only inherited computer resources nearly all already in public hands before they had taken power but also inherited public computer resources centralized to one entity, rather than multiple ministries.
- The author discusses at several points the role of IBM Chile.
- Prologue: The prototype control room that looks like a Star Trek deck (the back of the book comparison; the author uses 2001 A Space Odyssey) was intended to display macroeconomic data for the entire nation, with eventual specific control rooms in various ministries and offices focused on narrower data related to their own portfolios. (It's important to note, from the appendix, that the project originally only included data from 4 national economic categories relevant to one area of the government and completely left out the huge copper mining and agricultural sectors because they were under the oversight of other ministries and the project never got as far as government-wide implementation.) Allende (along with a military general) personally visited the prototype control room just over two years into his presidency and less than a year before his assassination. Unfortunately he didn't really get to see much on the tour because the electronics were overheated and malfunctioning.
- The intro chapter (chapter zero I guess):
 - Cybernetics can be hard to define, especially because it is so heavily interdisciplinary and has often faded into its applied disciplines more than it has stood alone. But it basically seeks to take lessons from natural biological systems of control and communication – which are of course far more highly advanced than any computer networks, even today – and apply them via technology to social, political, economic, and other types of systems. So, for example, the human nervous system and how it provides holistic feedback to the brain (noted in chapter 1) was a theoretical inspiration for the concept of Project Cybersyn in Chile. Early examples of cybernetic research as far back as World War II were concerned with figuring out how to rapidly and automatically process

incoming feedback information and make corrections faster than a person (such an airplane pilot or anti-aircraft gunner) can, although it took a while for the technology to catch up to the theory.

- The author argues that Project Cybersyn represents the fusion of two utopian projects: building a democratic socialist political economy within the constitutional order and building an internet for real-time control decades ahead of the curve. The constitutional promises were at the heart of the Allende project as a whole and represented a continuity with Chile's tradition up to that point of the longest uninterrupted chain of peaceful democratic transitions of power in Latin America from 1932 until the coup in 1973. This could have opened a new "Chilean model" independent of the two superpowers. But for that to be a success, Allende needed to develop a better means of managing the rapidly growing state-owned sectors and all their public employees, as well as to overcome economic challenges being thrown in his path daily by US covert operations both domestically in Chile and on the global financial and trade markets.
- It was hoped that – in addition to accumulating and processing data from around the country – software simulators of the economy would allow central planners to test the potential implications of making various policy changes before doing so. Had it gotten beyond the prototype phase instead of being interrupted by the military coup in 1973, some of the project designers hoped to include workers at the bottom levels of the economy in developing the software models to avoid the project being purely top-down control. The author emphasizes that the Project Cybersyn participants, who were generally white-collar professionals in the technology field, did not view themselves as apolitical "technocrats" but rather as attempting to harness technology to achieve explicit political aims and change society (not just tinker with the economy). But they didn't all agree on those exact political goals.
- [jump to notes below on Stafford Beer]
- Cybersyn was launched about a year into the Allende presidency, which lasted for just under 3 years total before the coup, partially in response to the struggles with the economic situation – many fomented by the US internally or directly by the US internationally – over the course of the first year. The technological solution was seen as a "creative" strategic tool to affect politics by straightening out the economy.
- The Cybersyn prototype was used to monitor the fall 1972 truck drivers' strike being financed by the United States
 - See this 1999 article in The Guardian on the US partial declassification of files related to covert US support of military, paramilitary, and economic activities in Chile ahead of the coup, such as the 1972 truck drivers' strike that "ratcheted up the sense of chaos and forced Chileans to queue for petrol, food and medical treatment."
<https://www.theguardian.com/world/1999/oct/11/pinochet.chile>
- The project was criticized by Allende opponents at home and abroad as a tool of totalitarian control if it became fully operational, but that's basically Cold War spin fueled by British tabloids when they got wind of it ahead of a planned public rollout in early 1973. How could four mainframe computers possibly result in totalitarian surveillance and control,

especially with US computer firms pulling out of Chile and participating in the US economic blockade? The author argues (chapter 1) that the project's theoretical view of the concept of "control" as defined by its consulting theoretician Stafford Beer was "self-regulation," i.e. not to control in the sense of domination but rather to be in control of itself rather than spinning apart. Control was about adaptive and evolving self-perpetuation of the whole system so that it didn't all break down. This supported the political goals of evolution within the constitutional order, not revolution outside of it. And in fact Beer's view of exceedingly complex systems such as an entire national economy was not that they should be handled with precise commands but rather with flexible controls that can absorb and work around a wide variety of scenarios and outcomes. Stable equilibriums (like a human body's homeostasis), not coercive domination of all aspects of life, was the object of this real-time control system. If something went wrong in one part of the economy, it would not necessarily be advisable (or even possible) to try to fix that aspect specifically, and it might be better to cover the problem by boosting a different part of the economic system in the meantime until things returned to normal in the first area. And if the equilibrium normal in some area was a problem then, that meant there would need to be a more structural change to the system to establish a new equilibrium point. (The book doesn't give an example of this but I think we could imagine a one-year crop failure as being an example of something that needs a temporary workaround provided by other sectors because you can't just demand more crops, while a permanent environmental change is going to need a permanent change in the system as a solution. And a hypothetical example like that could also be scaled up and down in size with varying solutions. A localized crop failure or permanent local environmental change could be mitigated by laterally negotiating with other parts of the system to compensate for it in other regions as if it's skin self-regulating its own temperature, while a nationwide failure or degradation would need a nationwide correction by a more vertical intervention as if it's someone deciding consciously to put on a sweater.)

- As another point in favor of the system being very unlike any Soviet comparisons (from chapter 2): a concept for a Soviet economic cybernetics system in the 1960s that never came to pass had called for a program to monitor and control 50 million economic variables, which was both an impractical level of control under the philosophy being pursued in Chile, and one that was simply not technologically possible with the available computer resources of four Chilean mainframes compared to the thousands of Soviet computers already in service. And it was deemed unrealistic anyway because under the Soviet concept, what would prevent the local-level managers or even higher-level bureaucrats from entering false data to meet arbitrary targets?
- Additionally in chapter 3 it is noted that the system in Chile was actually designed to throw out data that was "normal" as opposed to "anomalous" which would further avoid an all-seeing eye problem
- Project Cybersyn ended with the 9/11/73 military coup
- Chapter 1 notes are woven in above and below at relevant points

- Chapter 2 notes on the political situation [send scan to Rachel]
 - In the first year of the Allende administration, the government nationalized many of Chile's mineral wealth and other resources. In the second year, they wanted to better manage these resources, as well as the national economy. The State Development Corporation thought Beer and management cybernetics was the best way to help the Chilean government.
 - After the first year of Allende's government, many changes were made that put more money in the hands of more workers, increasing their purchasing power, and the popularity of UP [Popular Unity]. GDP increased 7.7%, production increased 13.7% and consumption increased 11.6% Allende knew for his socialist programs to succeed, he needed to show that the economy would thrive.
 - This nationalization process accelerated rapidly, with workers seizing factories and peasants seizing land that they were working. There wasn't much guidance for sector committees, and committees adopted different management styles, with some operating with a hands-off approach, and some managing production quite closely. The worker-owned factories also needed to be brought in and managed; administrative councils were created, which included blue-collar workers and allowed them a part of decision making.
 - Another problem was the new state-appointed manager-directors of newly nationalized factories or enterprises. While some were certainly dedicated to the work, there were some who were incompetent or even corrupt. This was driven by the decision to appoint them equally from all political parties, regardless of competency or knowledge of the industry. Some complained that the new state manager-directors simply took the place of greedy and corrupt executive boards. They got into clashes with union leaders, who performed a leadership role in their factories. Former private-sector managers also left and took their institutional knowledge with them.
- Chapter 3 covers the physical design and engineering of the network
 - Conceptual: *[Beer] proposed the idea of "roll-up," an iterative process wherein policies traveled down to the factories from the government and the needs of the factories traveled upward. He positioned management in the middle, where it formed a homeostat, that coupled the needs of the lower levels with the resources allocated from above. Government officials could therefore change and adapt government policies to meet the needs of the factories, so long as such changes did not have substantial negative effects on other areas of the economy.*
 - A prototype or demonstration control system was called Project Cyberstride (although this eventually came to refer specifically to the software) and it was supposed to come on line by March 1972, just 4 months into the overall Project Cybersyn. *"The system would rely on data collected daily from state-controlled industries and would use mainframe technology to make statistical predictions about future economic behavior. The system would update these predictions daily after Chilean computer operators entered the new data arriving from the enterprises."* Communication was key and turning data points into responsive action was the immediate objective. The hope was that not only would the higher levels of government be able to direct resources to emergencies soon but

that experienced mid-level managers of whole sectors would be able to train the inexperienced factory-level or enterprise-level state managers who were overwhelmed by the new acquisitions of the state. Cyberstride would also include software to simulate the Chilean economy.

- The state-controlled National Computer Corporation could only offer one of its four mainframes to the team to design the Cyberstride prototype around. And there weren't really many other computers in Chile that they could network to that mainframe. The solution was to rely on the well-established technology of Telex or teletype machines that could transmit data and messages over telephone lines. Computer operators at the center would then take this incoming data and manually convert it to inputs for the IBM mainframe on site, although they eventually began writing software to try to interpret Telex data and feed it directly to the mainframe without a human translator. The mainframe would run a comparison against previous data to check for significant variations and spit out alerts. The operators would then feed these alerts back into the telex network to transmit them both to the higher-level management and back down to the source of the variation, so they could confer. Initially this idea was also a problem because they had only two telex machines, but it turned out there were 400 unused telex machines in storage at the National Telecommunications Enterprise purchased by the Christian Democrats' government and left in storage. It was decided that the prototype project would install telex machines in the sectors of textiles, forestry, construction materials, and agroindustry, although only some of this actually happened.
- As a political objective for the use of the technology, the plan was to use the data feedback from factories to increase total production by increasing worker productivity, but not to eliminate jobs after increasing that productivity.
- Allende personally approved the prototype project in a 3 person meeting on November 12, 1971, finding the biological metaphors of cybernetics compared to the human body to be interesting and compelling given his background as a doctor. Allende specified that the project should be "decentralizing, worker-participative, and anti-bureaucratic." He also asked whether the system would be incorporating technology or design from the Soviets and apparently seemed fine with it not doing so.
- The software coding was partially outsourced to London because there were not enough experienced coders in Chile. Communication between Chile and London was maintained via a telex connection through the London remote office of Chile's state-owned copper company. The outsourced coders in Britain could not realistically deliver the level of software required by March of 1972 for all the planned sectors and ended up instead working toward a much smaller demonstration software package. They did however incorporate the absolute most cutting-edge statistical modeling concepts being published in 1971 for the first time, which would better identify what kind of data anomaly was being detected and whether or not it was actually an emergency or just noise.
- One problem the team in Chile realized fairly late in the process was that for any industry they wished to bring into the control system, they would first need to conduct a thorough study of the industry to decide what inputs to record daily and to figure out what a "normal" data range for

each input would look like, especially during an economically chaotic period. It was emphasized to them by the theorists that it was less important to collect data on everything and more important to collect data on the key chokepoints where things could have a big ripple effect.

- As the Cyberstride software was progressing and the Chilean Economic Simulator was being modeled and the Cybernet network of telex machines was being installed, planning and work began on the Control Center or Operations Room, which would be finished in November 1972.
- Stafford Beer also started imagining a sort of far-fetched idea of reversing the flow of information found in mass media broadcasts by installing a happiness or dissatisfaction meter in every home where every citizen could register their opinion on how things were going each day and this data in the form of rising or falling voltages from these meters would be aggregated for the government. He called this concept Project Cyberfolk. He also imagined a narrower version installed in factories where workers could register how they were collectively feeling to all their fellow workers and managers, potentially averting strikes by encouraging early intervention to improve conditions. All such meters would be analog and voltage-based to give some amount of anonymity when aggregating data. The concept was never implemented in Chile but separately came to be used for live cable TV political debate response trackers in the US.
- Chapter 4:
 - As US credit dried up and US trade was reduced to a trickle, and as Chilean copper prices declined, inflation was rising rapidly (180% price growth over 1972), and the Cybersyn team was finding that no matter how much work they put into trying to refine their modeling of the Chilean economy, they simply lacked enough data on key metrics to get anything accurate or usable out of the economic model. Gathering data on processes at the factory level required a huge amount of time and research as well as the cooperation of the manager on site, and all of this could be very tedious and slow. They were instructed to seek the input of floor workers, but rarely did. (The author confirmed this in many interviews with the people who conducted that research work on site and also noted that not a single worker ever got in contact to talk about the project despite extensive outreach efforts while researching the book, suggesting that they were basically never involved in Project Cybersyn at any meaningful level.) There had been strikes in the 1960s over the growing use of Taylorism practices for management efficiency in Chilean factories and it is likely that if Project Cybersyn hadn't been cut short by the coup, it would have turned into a major point of friction with the workers it aimed to empower.
 - Chapter 4 talks in some detail about members of the Chilean government who specialized in industrial design and promotion of new technologies and how they thought deliberately about the social, cultural, and political ramifications of design and adoption of new technologies. There was an extremely small cadre of recently trained (or currently student) industrial design and graphic design experts in Chile by the early 1970s and they were brought on board to design the space-age control room for Project Cybersyn. Many of the industrial designers who became involved in the project had already been working on advancing the goals of the socialist experiment by designing inexpensive, mass-market consumer goods that

could be produced domestically uniformly and by designing very precise domestic equipment for use in the agriculture sector and state social welfare programs to feed kids. Now they were tasked on the side with designing a cutting-edge, modernist, ergonomic room for a small number of high-level planners and politicians to review real-time economic data visually and work together to make decisions.

- They came up with a circularly-arranged lounge with new fiberglass designs for chairs and screen cabinets. There would be a combination of flat projector screens and imported television monitors on walls in a hexagon around the non-hierarchical circle of seven chairs with buttons built in to control all the screens and data feeds. One wall was dedicated just to alerts about emergencies of various scales. There were no tables and writing in the room was prohibited because it was believed that they should be verbally discussing decisions and then entering them directly into the computer system. There was also an adjoining kitchenette to facilitate a comfortable lounge atmosphere. They believed the visual design and aesthetic of the control room prototype needed to have a certain look to sell the overall project's continuation beyond the demo phase. The lowest tech element was probably that one wall was a fabric-covered magnetic board where physical representations of the economy could be moved around during discussions. The designers to this day dispute any inspiration from contemporary science-fiction media for the look of the control room, instead contending that the heavy use of fiberglass and polyester naturally made it look like that by default.
- It is also critical to note that at the time, they could not actually use computers to generate almost any of the visual representations (as opposed to numerical representations) they wanted to depict on screens in the control room. Instead, they needed to design how slides of this data would look graphically, then they would need someone to draw the graph or chart of the day's data, and then they would need to have a photographer physically convert it to something that could be shown. As the author notes, *"Although the operations room presented a sleek, futuristic vision of socialist modernity, to which an occupant could control the economy with the touch of a button, maintaining this illusion required a tremendous amount of human labor."* Graphic designers and a photographer would have to be updating slides every single day by hand, all day, if the room ever became operational to the extent envisioned. I think this is probably analogous today to technology firms promising automation that is actually provided by remote workers overseas using a camera and remote-control technology. Another section from the book in chapter 7 speculates that quote *"It is highly probable that the amount of human labor required to update the displays of information in the operations room would have also created substantial obstacles to its full implementation."*
- The armchair buttons, in lieu of a keyboard, were supposedly implemented to allow anyone with limited knowledge of computers from the highest politician to the lowest factory floor worker to walk into the control room and give a presentation. But it had the practical effect of allowing men who didn't know how to type to use the computer system in the control room without the intervention of a female typist or secretary who did know their way around a keyboard.

- By July 1972, the project team was trying to dramatically pick up the pace of their work, already on an ambitious timetable, amid mounting fears that the economic and political situation was deteriorating so fast that it might lead to the fall of the government. They wanted the demonstration prototype of the control room, the network, the software, and the economic model to be ready to show before the end of October so that they could start making progress on turning things around for Chile. Political battles over the ongoing nationalization – which was also continuing to strain state administration capacity – was radicalizing the petit bourgeoisie of the owners of small and medium sized enterprises against the government, convinced that they would be nationalized next. The US was continuing to finance both right-wing and left-wing agitation against Allende and was maintaining its undeclared economic blockade. In August 1972, the government declared a state of emergency in the capital. In September, Allende announced a right-wing military coup had been thwarted.
- Chapter 5:
 - In the face of a growing prospect of a military coup, members of the Cybersyn team who were part of the Allende government or its political movement became much more hard-nosed and pragmatic about accepting the limitations of the system as it existed and figuring out how to use it to keep from being overthrown, although they still wanted to expand it further beyond its demonstration sectors and industries to encompass the entire government, as soon as practical.
 - There was an internal debate as to whether or not to make a big national propaganda push in early 1973 announcing the launch of the Cybersyn system and what it could do. Ultimately, a more cautious approach was preferred, amid fears that it either would be viewed as an overblown boondoggle that couldn't deliver on its promises or would generate additional public backlash for trying to change everything in Chile too quickly at every level. But parts of it were forced into use behind the scenes before the end of 1972. And it ended up becoming very public in early 1973 anyway.
 - In October 1972, the month after the foiled coup plot, the aforementioned nationwide truck drivers' strike began. It was a strike of 40,000 middle-class self-employed truckers or small trucking company owners who had a professional association, as opposed to a union, with sympathy closures or lockouts by professional associations of a range of businesses, and it was purportedly launched in retaliation to the government establishing a state-owned trucking service for under-served rural transportation needs. Since the end of the 1990s, we have known that this strike was directly supported by the US, but that wasn't known at the time. It was intended to create so much economic gridlock and political instability – by means of closing roads and blocking delivery of food, fuel, factory raw inputs, and essential goods – that the government would resign, be impeached, or be overthrown. Instead, the government decided to use the new telex network set up to support Project Cybersyn to get real-time data on the strike from one end of the country to the other, a distance longer than across the United States, so that politically loyal engineers and managers could maintain operations at state-owned enterprises with a smaller number of people, start direct delivery services

to the public without need of private trucks or stores, and seize control of or reopen shuttered private factories or idle trucks. In a great demonstration of the lateral problem-solving the Cybersyn project hoped for, many factories began trading supplies directly to each other or shuffling them around to cover shortages. The military, with its dubious loyalties, was also deployed in 12 provinces to help reopen the economy by force – and when the strike culminated in a stalemate, Allende invited the military into the cabinet with the key portfolios of Interior, Public Works, and Mining. This compromise ended the strike but also strengthened the political and state role of the military.

- The government as a whole pivoted rhetorically in the face of the strike from saying it was merely representing the workers to saying that it would be giving “directives” to the workers, although it is worth differentiating here that the strikers were not exactly workers in the Marxian sense, so much as middle class or petit bourgeois small business owners. In fact, many actual workers found themselves locked out of work by business owners aligning themselves with the truckers association, which in turn had enforcers closing down businesses that didn’t voluntarily support them. Again, this speaks to US involvement. The National Manufacturer Association locked out all its private-sector member factory workers and some businesses paid workers to stay home. Professional class associations also shut down in support.
- There was a growing paranoia – justified by reality – among key political figures in the Allende government that had been involved in or running Project Cybersyn that they were all going to be killed by the right-wing in a coup or a counter-revolution and that the ideals of the project were probably only viable in a peaceful situation where that wasn’t a risk.
- Meanwhile Stafford Beer, remote in London again, was becoming politically radicalized and more idealistic about using cybernetics to not only improve industrial production but also distribution and consumption to keep the masses happy. And he argued for turning over a fully-realized Cybersyn network eventually to workers directly, comparing it to any other piece of automated factory machinery that a worker can learn to use. This was becoming increasingly detached from the realities on the ground in Chile and certainly did not take into account the political problems this would encounter, even just in terms of basic office politics, to say nothing of the fractious politics of centrist technology workers, hierarchical communist union leaders, and various strands of socialists in the Allende coalition, who all had different views on worker participation in governance and the silos of economic sectors or society as a whole.
- The government, fighting for its life, now regarded Cybersyn as functionally a collection of tools like the telex network, that might help it remain in power, rather than trying to build an idealistic integrated system that could advance revolutionary political and social goals it began with. In order to keep it alive, the Chilean project leaders began deliberately depoliticizing the entire endeavor, to gain buy-in from the centrists and the far-right under the new civilian-military combination. They never sought to propagandize or brag about it publicly as had once been considered. Nevertheless, a core group kept working on developing the project after the October strike, including some of its more idealistic planned elements, and continued that effort into the final year of the government.

- Chapter 6
 - covers the disastrous worldwide media coverage ahead of the scheduled public unveiling of Project Cybersyn in early 1973. It was portrayed as somewhere between a frightening Big Brother machine advancing the Soviet Cause or a ridiculous boondoggle in search of government programs to implement, whether worthwhile or not. And when the planned unveiling finally did happen, there was a lot of exaggeration or embellishment of what the demonstration prototype could actually do as opposed to what it was hoped the finally realized and completed system would have hopefully one day been able to do. Some critics attacked it as literally an impossible feat given what was known about available computing resources in Chile, which was right in some ways but wrong in that it misunderstood how the engineers had jury-rigged together what limited resources they had on hand in creative ways that no wealthy country would ever have bothered to try.
 - A month later, in March 1973, the midterm Congressional elections actually resulted in a significant decrease in the opposition majority in favor of Allende's coalition, but that only deepened the political impasse because it took off the table a possibility of a soft constitutional coup by a supermajority impeachment, or even just a veto-proof majority for legislation. On the one hand, the socialists were stunned by this outcome and felt encouraged by the results if they could press on and remain in power for the full presidential term. On the other hand, the political right now felt they would have to seize power by other means and a coup became an even greater certainty.
 - Meanwhile, the project still struggled along facing the same problems as the year before of having insufficient data to run the programs it was supposed to run or not getting it reported up and down the chain fast enough to be of use. Local level managers were doing the same thing they had done during the trucker strike when they had supply chain problems – which was going in person to other factories or suppliers to negotiate their own solutions and logistics, but they were doing it without the assistance of any computer system, because it was too slow. It was hard for the remaining project leaders to persuade others on wider adoption, which would have been necessary to make it work.
 - By April 1973, it was becoming clear that the theoretical basis or philosophical concept of the system was fading away and only the component technological tools were still of interest, and even these were struggling to serve their narrow purposes regardless of any abandoned big-picture objectives. The politicians had left the project to manage the crisis in the government as a whole and the less ideologically committed tech workers still involved were not as focused on social revolution through technology.
 - In May 1973, the opposition fomented a strike in the state-owned copper industry, while right-wing terror groups escalated violence so the government was forced to proclaim martial law in the capital. Meanwhile, Cybersyn was slowly continuing to bring more industry enterprises into the telex network, eventually getting about half of state-owned or state-controlled enterprises by revenue (or a quarter by number) into the system, albeit far too late to help the national crisis.

- On June 29, 1973, there was an attempted military coup where putsch tanks faced off against constitutionalists within the armed forces. On July 26, the same day as a final meeting between Stafford Beer and President Allende, right-wing military members assassinated Allende's liaison to the constitutionalist forces within the military, who had been in the meeting with Beer that day.
- During the August 1973 reprise of the truckers' strike, the telex network of Cybersyn swung into action again to restore as much distribution as possible of vital goods and resources to keep production and consumption from cratering. But by this point, no matter how well the creative computer network was doing on tracking the locations of state-controlled delivery trucks, Cybersyn could do nothing to stop the right-wing paramilitaries and strikers from blockading the trucks, destroying them, or murdering people. Nor could it halt attacks on pipelines and power transmission lines.
- As late as September 3, 1973, days before the final coup, opposition publications (generally supported with CIA funding) were still hyping up the barely functional demonstration prototype of Project Cybersyn as a totalitarian method of control over all Chilean life by a repressive, radical left-wing government. Around the same time, Allende's inner circle briefly considered moving the operations control center to the presidential palace, perhaps just for easier access to the telex readouts on the emergencies all up and down the country, but they never got that far. Some project members worried that trying to install it in the presidential palace might damage its historic architecture. On the 11th, the Air Force began firing air to surface rockets into the presidential palace, as the Allende government, the dream of Chilean democratic socialism, and Allende himself met their end.
- On the 12th, the leader of Project Cybersyn hastily gathered up four boxes worth of documents on the project and walked out of their building to take them to safekeeping before troops could arrive.
- Chapter 7 (conclusion)
 - The military halted Project Cybersyn's operations, such as they were, immediately, conducted a brief review to see if there was anything worth keeping, and destroyed most of the system. It would not be necessary under either a military command model or a neoliberal privatization push.
 - *"Given the progress made on Project Cybersyn before the military coup, there is reason to believe that the system was, for the most part, technically feasible and that many, if not most, of its technological components could have reached completion if given more time. But Project Cybersyn was also tied to Chile's peaceful socialist revolution, a political development that clashed with U.S. foreign policy in Latin America during the Cold War."*
 - *"Even if the technological components of Project Cybersyn had reached completion, the system could not have addressed such problems as runaway inflation, lack of foreign credit, falling copper prices, and black-market hoarding."* (To say nothing of right-wing terrorism and military plots backed by the CIA.)
 - The author believes the project would have also struggled a great deal with needing huge amounts of training for participants to use it, especially

at the factory level, both technically and in terms of its potential friction with various power blocs who might be reluctant to adopt it.

- There's a lot of guys we could talk about if we had more time – so you should read the book – but we can't do this topic without talking about **Stafford Beer**. He was a British cybernetics theoretician who had been working in the field since 1956 when he joined the major UK company United Steel and launched a computer research department aimed at developing operational management cybernetics, i.e. computer-assisted management of company operations, basically as an extension of scientific management theories from the earlier 20th century. In the 1960s he was consulting in the field of cybernetics. In mid-1971, he was invited by the Chilean Production Development Corporation under the Allende government to come down to Chile to consult on applying cybernetics to state-owned industries. He hoped that the project in Chile would ultimately allow national economic management decisions to be devolved all the way down the chain to the most local level of control with and perhaps by the workers, and he believed that that devolution of power was also the broader political objective of the Allende government and the movement behind it. (That is cited in the book from his papers.) After the coup, he did a combination of consulting and teaching but eventually returned to the democratic control potential in cybernetics in the 1990s when he developed a method of problem-solving and decision-making in small teams without hierarchy. This was a trademarked consulting method that he called "Syntegrity." He also coined the phrase "The purpose of a system is what it does" to refer to the difference of the results any system delivers as contrasted with its purported intentions by its creators and operators. It describes systems bluntly as they are, not as they claim to be.

https://en.wikipedia.org/wiki/Stafford_Beer

https://en.wikipedia.org/wiki/The_purpose_of_a_system_is_what_it_does

- The book (intro and chapter 1) essentially argues that Stafford Beer was recruited specifically because his theoretical work at the time was focusing on trying to resolve the paradox of maintaining stability while undertaking structural changes to a system, which matched the government's broad socio-political goals, and that he had shown interest in balancing autonomous decision-making with system cohesion.
 - It is still a bit vague as to how he thought the system might work in terms of that balance and his opposition to "bureaucracy" but also continued opposition to unaccountable authoritarianism. I'm reminded of the early Russian Revolutionaries endlessly denouncing bureaucracy as the source of economic incompetence and sluggishness under the Tsar's regime shortly before instituting one of the largest bureaucracies in world history out of a recognition that on some level it was necessary to the operations of the state. The author implies that Beer might have been more fixated on the optics of a Churchill meets Sci-Fi war-room style control room setup with chairs, buttons, and color TVs, rather than on the actual details of his system of governance assisted by cybernetics.
 - Beer did not view his system concept as hierarchical. High-level decisionmakers would set the broad strokes of policy for the long-range future based on both external inputs and data filtering upward, and they would step in to sort out emergencies the lower-level people had been unable to resolve internally or laterally ... but conversely lower-level day-to-day decisionmakers would have to make their daily choices based in part on information and strategies being handed down to them. Neither the high-level people nor the low-level people can really do their jobs and make adjustments without responding to continuous feedback from the

other, and neither can do their jobs if they are all overwhelmed by more information than they can handle. He also emphasized lateral and diagonal communications across departments, ministries, companies, and even individual factories, so that managers could come up with creative solutions to problems without having to go up and down a bureaucratic chain of command to make contact outside their own immediate sphere. And he wanted to implement an emergency system for people at ground level to alert people at the very top of a serious problem if they weren't getting a response to avoid it being filtered out of view. (Again this feels a bit vague.)

- Beer, like the Chilean socialists in government, emphasized that the top level of his ideal system was essentially reserved for the people making "values" decisions. You don't want those people bogged down in the daily minutiae of production quotas and outputs. You want them charting a course for the nation overall based on values, in this case socialism, and then the other levels of the system should figure out how to implement those values. And when those values conflicted with each other at the lower levels, the top level political actors would decide who or what to sacrifice to maintain systemic stability and the overall vision.
- In chapter 2, Beer is quoted as describing a state of "overstability" to describe a system that is so stable that it is immovable in the face of changing circumstances or conditions, which is not compatible with the self-regulation survival mechanisms of true homeostasis.
- The book also suggests that Beer came from an unusual branch of the field of cybernetics which was civilian industrial management consulting and theory rather than literally from the military or military-funded research in academia. The author notes that just before the Chilean project, the biggest usages of similar national data feedback systems were things like US Defense Secretary Robert McNamara trying to track the political situation in Vietnam by local political division in real time so he could wage the Vietnam War more efficiently. There were some civilian cybernetics projects in the US around things like urban planning, but overwhelmingly it was being used either inside the military or in military-funded research settings.
- Beer was also recruited because his consultancy in the 1960s had been contracted with the Chilean steel and rail industries, although he was not personally involved in the work there, and a local student involved in the work ended up later in one of the positions responsible for nationalizing industries under Allende. By coincidence, in 1970, the year before he was recruited, Beer was delivering speeches on the need for peaceful systems revolutions without violence or anarchy, because systems of governance were not evolving fast enough to cope with a changing world, but the politicians in Chile were not aware of these speeches when he was recruited. It just happened to strengthen the compatibility of his personal vision with their movement's aims.
- The author states that Beer was not a Marxist but was aligned more or less with the Fabian socialist tradition within the UK Labour Party, which meant that he shared similar tactical and structural thinking though not necessarily precisely the same ideology as the Allende government when he arrived in Chile in 1971.
- Per chapter 2: A lot of Beer's initial work in Chile had very little to do with technology and more to do with providing emergency basic management consulting advice to a deeply overwhelmed, young, inexperienced government, but he did try to at least make sure that his interim recommendations would

support and not impede future implementation of a technology-backed cybernetic solution to the management of the national economy, particularly emphasizing stronger communications within the state economy, since that would also be the basis for a cybernetic network.

- The author of the book, who interviewed Stafford Beer before his death in 2002, argues that the experience of working in Chile, being near the heart of the revolutionary fervor, and seeing it be crushed under the boot heel “profoundly” changed him for the rest of his life. Shortly after the coup, he first spent a couple years frantically working his professional networks to evacuate to safety or secure the release of as many of his Chilean colleagues from Project Cybersyn as possible, and then when that was finished he went from a high-rolling consultant in the London area to a semi-hermit in the Welsh countryside. His writings on cybernetics continued, but took on a far more socially-oriented bent. In the mid-1980s, he made a short-lived attempt to build a similar computer system to Project Cybersyn for the new democratic government of Uruguay but it didn’t get far. He also made an even shorter-lived attempt to help a social democratic government in Venezuela.